

► **Headline:****Public participation and integrated
water resource management
in central Africa**► **And:**

- Mayotte: Is freezing the price of plastic bottles of natural or spring water in the department a lasting solution to the drought?
- Water: the new obstacle to building permits in France
- Re-authorisation of swimming pool water treatment by "Arche Chlorine" in France: What are the prospects for future generations?
- Cambodia: Tonle sap lake, an ecosystem to be preserved for present and future generations
- Cameroon: The need for access to running drinking water for all



Editorial

Water, a priority for everyone around the world,

P.5

by Fatma NDIAYE, Editor in Chief, PhD in public law, Clerk

Europe

Mayotte: Is freezing the price of plastic bottles of natural or spring water in the department a lasting solution to the drought?

P.10

by Sabine Ndzengue Amoa, Legal consultant and speaker specializing in health law, environmental law, public law

Water: the new obstacle to building permits in France:

P.26

by Sabine Ndzengue Amoa, Legal consultant and speaker specializing in health law, environmental law, public law

Re-authorisation of swimming pool water treatment by “Arche Chlorine” in France: What are the prospects for future generations?

P.38

by Sabine Ndzengue Amoa, Legal consultant and speaker specializing in health law, environmental law, public law

Asia

Cambodia: Tonle sap lake, an ecosystem to be preserved for present and future generations

P.52

by Thierry Noël ; Former Safran logistics technician; Secretary General of the ASPROBIO AGM association.

Africa

Public participation and integrated water resource management in central Africa

P.58

by Michele Désirée OKALA ABEGA ; PhD in International Relations; Assistant Teacher at the University of Yaoundé II; Coordinator of the Réseau Eau et Climat des Organisations de Jeunes d’Afrique centrale (RECOJAC); Head of the environment department within the l’Association des Femmes de l’eau, assainissement et Environnement du Cameroun (AFPEEC).

Cameroon: The need for access to running drinking water for all

P.76

by JEAN MARIE AMOA, Former certified PE teacher, Vice-president of the ASPROBIO AGM association

Front cover:  AdobeStock @Riccardo Niels Mayer

Water, a priority for everyone around the world

Water is a vital source for people around the world. It is an essential element for the survival of human beings, including the biosphere. It is to be noted more and more, the rarity of this resource. This rarity is the result of various factors, including climate change and human activities.

A- Climate change, with its corollaries, leads to water resource scarcity

Climate change has real impacts on water resources:

- Variability of the hydrological cycle,
- Increased dryness,
- Melting of glaciers causing countless floods.

The quality of water tends to decrease with the extent of the phenomenon of climate change. Biodiversity is also highly threatened. Human activities also contribute to the degradation, even the scarcity of water resources in that they create both environmental and health problems. All of these factors are not without consequences for sustainable development, which is an essential pillar for ensuring the survival of future generations. The achievement of the Sustainable Development Goals as recommended in the Brundtland report is threatened by as many factors, thus calling on the actors of the international community to act and develop efficient practices and mechanisms in this context.

B-Resource scarcity affects all continents

The scarcity of water resources concerns all parts of the globe. Countries in the North, as well as those in the South, are feeling the effects of water scarcity. Admittedly, the management mechanisms may differ according to the environmental or even socio-economic context, but impacts are noted, thus inviting global or even concerted actions.

The geopolitics of water indeed raises various issues relating, among other things, to the difficult access, quality or cost of water. Rivalries can thus result when all continents : Europe, Africa, Asia, America and Oceania are affected by this rarity.

Populations suffer from the impacts of poor quality water consumption. The use of water that is unfit for consumption increases the health risks and thus promotes the development of diseases. Similarly, with climate change, the phenomenon of migration is accentuated with the quest for a better environment capable of providing better living conditions.

The scarcity of water resources therefore invites actors at all levels, whether private or public, national, regional or international, to multiply ac-

tions in the context of sustainable development.

All continents are concerned; from north to south, from east to west, the water crisis is felt.

C-The need to rethink the use of water and fishery resources for future generations

Given the many aspects that further accentuate the scarcity of water resources, it is necessary to rethink the use of water and fishery resources for future generations. As such, it would be necessary to develop a synergy of actions on the social level, as well as on the economic, political and environmental levels, among others. These actions must aim to increase resilience and promote development. The stakes are such that concrete solutions must be provided to the current difficulties in managing water resources in order to ensure the survival of future generations.



By Fatma NDIAYE

Editor in Chief

PhD in public law; Clerk; Cheikh Anta DIOP University of Dakar,

Member of the Laboratory for Studies and Research in Environmental and Health Policy and Law (LERPDES), UCAD/FSJP

Editorial Comittee

Sabine NDZENGUE AMOA	Director of publication; Legal consultant; speaker; Member of the CMDE and CEC commissions of IUCN; France
Emmanuel RAMCENE	Deputy Director of Publication, PhD in Public International Law; University of Perpignan, France
Fatma NDIAYE	Editor in Chief; PhD in public law; Clerk, Cheikh Anta DIOP University of Dakar, Member of the Laboratory for Studies and Research in Environmental and Health Policy and Law (LERPDES), UCAD/FSJP
Mamy Nirina Rolland RANDRIANARIVELO	Consulting Member on Southern Africa; Meteorologist - Environmental engineer; Founding President of the Environmental Association MAHATSANGY
Maëlle NICAULT	Consulting member on Europe and overseas; Responsible for the implementation of the Regional Development Plan (SAR); PhD in urban planning and development from the University of Grenoble, Co-president of the Sillages association based on Reunion Island

Scientific committee

Ndickou GAYE	PhD in Environmental Sciences and Management/ and in Coastal Governance ; Department of Geography (FLSH). Cheikh Anta Diop University of Dakar, Senegal. Member of UMI SOURCE (Sustainability and Resilience, IRD/UVSQ)
Ibouraima YABI	Agroclimatologist, geographer, Research professor, Univ. Abomey-Calavi ; Benin
Firmin Rossi CHUITON TENE	PhD in Law; University of Dschang, Cameroon
Mamadou NIENTAO	Professor of Public International Law, specializing in water resources governance, at the University of Legal and Political Sciences of Bamako (Mali)
Rufin Thierry KEIMENI WELADJI	PhD in Public Law from the University of Dschang-Cameroon, Teacher at the Faculty of Legal and Political Sciences of the University of Garoua-Cameroon.
Mohamed BADALLA	PhD in Geography and the environment; Ibn Tofail University, Morocco
Rose Marie AMOA	PhD in Forensic accounting from Charima University (Charisma University) -an academic institution located in the Turks and Caicos Islands, British Overseas Territories of the United Kingdom
Prune KOMBA	PhD in Geography; Specialist in Science and technology in remote sensing and geomatics applied to environmental themes; R&D research associate (France)
EL KIHAL ABDELGHANI	PhD in private law, Ibn Zohr University, Agadir, Morocco

Reading committee

Boalidioa TANKOANO	PhD in GIS, Remote Sensing and Forestry; Nazi Boni University/ Burkina Faso; Institute of Rural Development; Department of forestry; Correspondent of journals IJIAS-IJIRS
Ulrich Kevin Kiangubeni	PhD in public law; PhD in environmental geography; Marien Ngouabi University; Brazzaville; Congo
Meryame SAHI	PhD in Economics, Sidi Mohamed Ben Abdellah University of Fez, Morocco
Issa Pave ABDEL NASSER	Ph/D in Private Law, teacher at the University of Garoua (Cameroon).
Mireille Esther BATJOM	PhD in Public Law; Associate Researcher Renewable Energies/Extractive Governance CARPEM- African Center for Energy and Mining Policy Research
Prince Loïque MABA NGOULOUBI	PhD in Geography; Speciality: Rural Geography; DENIS SASSOU NGUESSO University; Republic of Congo (Brazzaville)

Editorial office

Thaïs ARIAS	Responsible for translation; Language teacher, translator and interpreter
Saliou BABELLO	Expert-Consultant in Extractive Industries Law; Researcher in Human Rights and Humanitarian Law; Promoter of « Babello Consulting » (Advice and Expertise)



Image: AdobeStock @AlenKadr

Mayotte: Is freezing the price of plastic bottles of natural or spring water in the department a lasting solution to the drought?



By Sabine NDZENGUE AMOA

Legal consultant and speaker specializing in health law, environmental law, public law.

<https://sabinendzengueamoaconsulting.fr>

Introduction	12
I- How is the water price freeze defined in decree no. 2023-611 of July 18, 2023?	12
A- What does article L410-2 of the commercial code provide?	12
B- Content of decree no. 2023-611 of July 18, 2023	13
II- Mayotte: A rich archipelago despite the misery, breakdowns, and ambient shortages	13
A- A rich archipelago	13
B- Ambient misery	14
III- The risks of the absence of water for man and his activities	17
man and his activities	17
A- The risk of starvation	17
B- The epidemics	17
C- Climate migrations	18
D- Impacts on electricity production	18
IV- Conclusion- Suggestions to state authorities	18
A- Faced with the dilapidated state of the water network	18
B- Faced with drought and water shortage	19

Abstract

The drought in the department of Mayotte leads to decisions such as

freezing the price of water bottles, as well as water cuts.

Decree No. 2023-611 of July 18, 2023, provides that the wholesale

and retail sale prices in Mayotte of natural mineral or spring waters without added sugar or other sweeteners or flavored and without carbon dioxide, contained in plastic bottles may not exceed, for each trade, those recorded on July 3, 2023.

Ambient misery; as well as the various breakdowns and shortages are part of the daily life of the population of the archipelago.

A paradoxical situation because the department of Mayotte is nevertheless a rich archipelago, with many endemic terrestrial and marine species. The risks of the absence of water for man and his activities: famine, epidemics, climatic migrations must lead the departmental and state authorities to rethink the water network and the solutions to overcome the drought; in compliance with the Barcelona Convention for the Protection of the Marine Environment and the Coastal Region of the Mediterranean and its Protocols.

Introduction

The price of bottled water is frozen in Mayotte; water cuts are also carried out.

These restrictions are made necessary by the drought that is raging in Mayotte, as well as by the dilapidated state of the network. Faced with the drought, the prefecture announced the freezing of the sale prices of water bottles, until December 15, 2023.

« Mayotte is facing an unprecedented drought this year. Except for 1997, there has never been so little rain in the department ». In a press release, the prefecture of Mayotte announced Monday that water cuts were maintained in areas where economic activity is the most important. In the communes of Mamoudzou, Koungou, Pamandzi and Dzaoudzi, the water will be cut off every night, 7 days a week, between 4 p.m. and 8 a.m.

The thirteen other cities of the French department of the Indian Ocean will have to face three «water laps » 24 hours a week, from 4 p.m. to 4 p.m. the next day, indicates the prefecture of Mayotte in a press release¹.

It is important to analyze the contours of this decree (I), the characteristics of this archipelago (II), the risks of the absence of water for man and his activities (III), as well as the possible solutions in the long term to prevent the same causes from producing the same effects in the same conditions (IV).

I- How is the water price freeze defined in decree no. 2023-611 of July 18, 2023?

Decree No. 2023-611 of July 18, 2023² is relative to the selling prices of bottled water in Mayotte.

It is taken pursuant to the third paragraph of Article L. 410-2 of the Commercial Code.

A- What does article L410-2 of the commercial code provide?

Except in cases where the law provides otherwise, the prices of goods, products, and services subject prior to January 1, 1987, to Ordinance No. 45-1483 of June 30, 1945,

¹ - https://fr.style.yahoo.com/mayotte-intensification-coupures-d-eau-152119783.html?guccounter=1&guce_referrer=aHR0cHM6Ly93d3cuZ29vZ2xILmNvbS8&guce_referrer_sig=AQAAAIrGXp1vcghqpH5-gyzKmjvJu9mAhlBdN_X0uV5_xeCINM0tuX4os9iQp1xDSLbM5RsMYtPP8GThHq78W7VYFZ7qJdQT_5puvUk9cSEZL3ioxRoBbSEsu2aqH5T40OMBH_zO0HTzWbCXAV7FBr-8UcGt4RDnckjuVCsgxj01wJ0jf

² - <https://www.legifrance.gouv.fr/jorf/id/JORFTEXT000047858089>

are freely determined by competition.

However, in sectors or areas where price competition is limited due either to monopoly situations or lasting supply difficulties, or to legislative or regulatory provisions, a Conseil d'Etat decree may regulate prices after consultation with the Competition Authority.

The provisions of the first two paragraphs do not preclude the Government from adopting, by decree in Council of State, against excessive price increases or decreases, temporary measures motivated by a crisis, exceptional circumstances, a public calamity, or a manifestly abnormal market situation in each sector. The decree is issued after consultation with the National Consumer Council. It specifies its period of validity which cannot exceed six months.

B- Content of decree no. 2023-611 of July 18, 2023

It provides that the wholesale and retail sale prices in Mayotte of natural mineral or spring waters without added sugar or other sweeteners or flavored and without carbon dioxide, contained in plastic bottles cannot exceed, for each trade, those recorded on July 3, 2023. The prefect of Mayotte may, however, set by decree maximum prices applicable to all establishments in the same category of trade, calculated from the average of the prices recorded on this same date. in a representative sample of establishments. The provisions of this decree are applicable until December 15, 2023.

Freezing the price of bottled water; corollary of the drought situation in the department of Mayotte contrasts bitterly with the wealth that abounds in the archipelago.

II- Mayotte: A rich archipelago despite the misery,

breakdowns, and ambient shortages

The archipelago has a rather incredible marine and terrestrial biodiversity.

A- A rich archipelago

Mayotte has many endemic terrestrial and marine species.

1-Many endemic terrestrial species

Located in the Comoros archipelago, northwest of Madagascar, Mayotte is a treasure trove of biodiversity. A 140 km long barrier reef surrounds the two main islands as well as 18 islets, and delimits a vast lagoon, one of the largest and deepest in the world. These waters are home to an incredible diversity of marine organisms: fish, molluscs, corals, marine mammals...

The terrestrial environment is not to be outdone. Mayotte appears as one of the richest tropical oceanic islands in the world in terms of native flora, regarding its surface area. There are many endemic species, or sub-endemic to the Comoros archipelago.³

2-Mayotte Marine Nature Park

The French Office for Biodiversity manages the Marine Nature Park of Mayotte, in the Indian Ocean.

Created on January 18, 2010, the Mayotte Marine Nature Park is located north of the Mozambique Channel, considered a global hot-spot for biodiversity. It covers an area of 69,000 km² including the lagoon, territorial waters, and the entire exclusive economic zone (EEZ) delimited around Mayotte.

³ -<https://biodiversite-outre-mer.fr/territoires/mayotte>

The Mayotte Marine Nature Park is limited to the northwest by the EEZ of the Comoros, to the northeast by the National Nature Reserve of the Glorieuses Archipelago, and to the south and east by the EEZ of Madagascar.

The Park borders the entire coast of Mayotte and concerns 16 municipalities out of the 17 that make up the territory. It is home to the protected areas of the S-shaped pass, N'Gouja, Saziley and Papani as well as the marine part of the Mbouzi Islet National Nature Reserve created in 2007 and managed by the Association of Naturalists of Mayotte.

The first overseas marine natural park, it covers 480 km² of coral reefs, 700 hectares of mangroves and as many sea grass beds. It also includes the remote bank of Zélée and the submarine volcano located 50 km east of the island of Mayotte. Appeared in 2018, the latter rises 800 meters above the seabed located at a depth of 3500 meters.⁴

The natural environments of Mayotte are however greatly degraded by human activities, due to a very high population density.⁵

B-Ambient misery

In the Indian Ocean department, the minimum wage and social minima are lower than those in mainland France. Civil servants, on the contrary, receive a salary increased by 43%.

Chirongui (Mayotte). – At the time when the overseas territories were colonies, the salary of State agents was substantially increased, to make these territories attractive and to ensure a state presence there: this was the “colonial supplement”.⁶

⁴ - <https://www.ofb.gouv.fr/le-parc-naturel-marin-de-mayotte>

⁵ - <https://biodiversite-outr-mer.fr/territoires/mayotte>

⁶ - <https://www.mediapart.fr/journal/economie-et-social/200723/mayotte-la-misere-pour-les-uns-la-sur-remuneration-pour-les-autres>

An imbalance between the treatment of civil servants and the rest of the population who live in poverty.

C-A risky archipelago not recommended for tourists: Various breakdowns and shortages

Crime

Minor crimes

Crimes of opportunity and petty crimes, such as pickpocketing and purse theft, occur frequently. Thieves may target foreigners, particularly in the Kawéni district of the capital Mamoudzou, and in busy public places such as:

- Markets;
- Airport and public transport facilities;
- Hotel lobbies;
- Restaurants, terraces and cafes;
- Tourist attractions.

During your stay in Mayotte:

- Always store your personal belongings, including your passport and other travel documents, in a safe place;
- Do not keep your passport and other identity documents in the same place and carry a photocopy with you rather than the original;
- Avoid flaunting wealth or wearing expensive jewelry;
- Avoid carrying large sums of money or non-essential valuables;
- Avoid deserted streets after dark;
- Be aware of your surroundings, especially in crowded and touristy places;
- Find out about the safest beaches;
- Be especially careful when withdrawing money from ATMs.

[sur-remuneration-pour-les-autres](https://www.mediapart.fr/journal/economie-et-social/200723/mayotte-la-misere-pour-les-uns-la-sur-remuneration-pour-les-autres)
Consulté le 22 juillet 2023.

Burglaries

Home burglaries happen. Burglars sometimes target homes or apartments that are rented or owned by strangers.

- Choose well-secured accommodations.
- Take care to lock doors and windows at night and when you are away.

Vehicules

Thefts and carjackings happen. Luxury cars and rental cars could be particularly targeted.

- Familiarize yourself with your ride before you begin your journey.
- Lock doors and windows always.
- Keep your personal belongings out of reach.
- Park your vehicle in a safe parking lot, especially at night.
- Never leave your personal belongings in a vehicle unattended, even in the trunk.

Violent crimes

Violence linked to clashes between criminal gangs occurs regularly. Criminals sometimes use bladed weapons or firearms.

Although violent incidents generally do not target foreigners or tourists, there is a risk of being in the wrong place at the wrong time.

Always be alert and aware of your surroundings.

Demonstrations and civil unrest

Spontaneous protests and civil unrest occur from time to time in major cities due to socio-economic tensions. Clashes between

protesters and security forces took place.

Even protests that claim to be peaceful can suddenly turn violent. They can also greatly disrupt traffic and public transport.

- Avoid all demonstrations and large gatherings;
- Follow the guidelines of local authorities;
- Check local media regularly to keep up to date.

Mass gatherings (large scale events)

Aquatic activities

Coastal waters can be dangerous. Rescue services do not always meet international standards.

If you plan to practice water sports such as scuba diving, personal watercraft, or parasailing:

- Make sure the equipment is in good condition;
- Make sure you are provided with helmets and life jackets;
- Do not participate in any nautical activity when your faculties are impaired by alcohol or other substances;
- Check if your travel insurance covers incidents related to recreational activities;
- Follow the instructions and warnings of local authorities.

Hiking

If you plan to hike:

- Never go alone and always hire an experienced guide working for a reputable company;
- Purchase travel insurance that covers

helicopter rescue and medical evacuation services;

- Make sure you are fit enough to meet the challenges of your activity;
- Make sure you have all the necessary equipment, and keep up to date with the weather and sources of danger;
- Inform a loved one of your itinerary and the expected time of your return to camp;
- Obtain specific information on the hiking trails before leaving, and do not venture outside the marked trails.

Women's safety

Women traveling alone may experience some forms of harassment and verbal abuse.

Piracy

Pirates commit attacks and armed robberies against ships in coastal waters and, in some cases, further out to sea. Attacks in the Indian Ocean cannot be ruled out.

Navigators should take appropriate precautions.

Power outages

Due to extreme weather conditions and the fact that Mayotte has only one electricity supplier, blackouts occur from time to time.

Water shortages

Due to below average rainfall in recent years, Mayotte regularly experiences water shortages.

Provide sufficient supplies of water.

Public transport

There is no public transport in Mayotte. You may need to rent a car.

Taxis

Taxis are the only urban transport alternative if you don't want to drive yourself. Although they are an affordable option, they are not always safe.

- Avoid hailing a taxi on the street;
- Only use reputable taxi companies through establishments such as hotels;
- Book your taxi in advance if possible.

If you absolutely must hail a taxi on the street:

- Do not get into a taxi already occupied by other people;
- Carefully note the plate number and the name of the taxi driver;
- Communicate this information immediately to your loved ones

Ferry

A ferry service provides a link between the two main islands, Grande-Terre, and Petite-Terre.

Sometimes ferry accidents happen because some ships are overloaded and poorly maintained.

Do not board a boat if you feel it is overloaded or unseaworthy.

Road safety

Most roads are paved.

Some roads can be dangerous due to potholes, lack of maintenance, poor lighting, and lack of traffic lights.⁷

Poverty and crime are scourges with serious consequences. The absence of water will not help to absorb this.

III-The risks of the

⁷ - <https://voyage.gc.ca/destinations/mayotte>

absence of water for man and his activities

Starvation; epidemics due to malnutrition; Climate migrations are part of the risks associated with the lack of water for humans and their activities.

A-The risk of starvation

Famine is often associated with a lack of food. However, increasingly, it is not only caused by food insecurity, but also by a lack of safe water and by problems of sanitation and health, especially regarding the prevention and treatment of diseases.

Unsafe water and poor sanitation can cause malnutrition or make it worse. «No matter how much food a malnourished child eats, their health will not improve if the water they drink is unsafe», explains Manuel Fontaine, Director of Emergency Programs at UNICEF. Unsafe water can cause diarrhoea, which prevents children from getting the nutrients they need to survive and eventually leads to malnutrition. Malnourished children are also more vulnerable to water-borne diseases, such as cholera. It is estimated that insufficient access to water, hygiene and sanitation is responsible for around 50% of malnutrition in the world.⁸

B-The epidemics

No one can live without water since the human body is made up of more than 65% of it. Although it is a right for all, 2.1 billion people still do not have drinking water in their homes. And every day, more than 1,000 children under the age of 5 die from the consequences of unsafe water. On World Water Day on March 22, let's come back to the consequences of this situation.

⁸ - <https://www.unicef.org/fr/recits/quatre-choses-a-savoir-sur-leau-et-la-famine>

Diseases... Without water human beings cannot survive more than three days. Without access to drinking water, many people are therefore forced to make do with polluted, dirty, or infected water. However, «this is a major health risk for young children who are the most sensitive to the quality of the water they consume», indicates the World Vision association. In effect, «from contaminated water result many diseases, such as cholera, malaria, lead poisoning, or diarrhea». So, «more than 1,000 children under the age of 5 die from the consequences of polluted water every day».

... without clean toilets. Often the water is contaminated with excrement. Access to drinking water is thus closely linked to access to safe sanitation. «The Vision du Monde association also builds toilets designed to avoid contact between people, water sources and human excrement.». It «also raises awareness of the risks associated with the practice of open defecation». An essential need when a third of the world's population does not have access to improved sanitation systems.

Maternal mortality. Another consequence of the lack of access to clean water, «more than 800 women die every day from complications that occur during pregnancy or childbirth», add the United Nations. Partly caused by a lack of hygiene, for which clean water is necessary.⁹

Climatic migrations are also part of the risks.

C-Climate migrations

Faced with the recurrent drought, and its corollaries, the Mahorais are and will be tempted in the short, medium, and long term to immigrate not only for climatic reasons, but also for economic reasons.

⁹ - <https://www.ladepeche.fr/2019/03/22/quelles-sont-les-consequences-du-manque-dacces-a-leau-potable,8084240.php>, consulté le 22 Juillet 2023.

The complexity of the climate migration phenomenon is accentuated by the fact that the main reasons for immigration are primarily economic, social, or political.

Indeed, climate changes influence livelihoods; as well as food resources:

- The poorest are often more exposed to climate risks.
- They are more vulnerable to the adverse consequences of climate change.
- They have less means to cope with the damage suffered.¹⁰

D-Impacts on electricity production

The water used to cool nuclear power plants is cut off in the event of drought and heat waves. And this reduces the production of electricity even though the needs are increased: fans, air conditioning, refrigerator... are very consuming electricity.¹¹

IV-Conclusion-Suggestions to state authorities

Water is part of the nation's common heritage. Its protection, enhancement, and development of usable resources, while respecting natural balances, are of general interest.

Respecting natural balances involves preserving and, where appropriate, restoring the natural functions of aquatic ecosystems, whether surface or underground, including wetlands, and marine ecosystems, as well as their interactions. These func-

tionalties are essential to the recovery of biodiversity, to adaptation to climate change as well as to the mitigation of its effects and participate in the fight against pollution. As such, aquatic ecosystems and marine ecosystems constitute essential elements of the Nation's heritage.

Within the framework of the laws and regulations as well as previously established rights, the use of water belongs to all and each natural person has the right to access drinking water, according to the methods and for the essential uses mentioned in article L. 1321-1 A of the Public Health Code, under conditions economically acceptable to all.

The costs related to the use of water, including the costs for the environment and the resources themselves, are borne by the users considering the social, environmental, and economic consequences as well as the geographical and climatic conditions.¹²

A-Faced with the dilapidated state of the water network

Access to water for all households must be secure. On December 18, 2013, the UN General Assembly adopted a resolution recalling «that the right to safe drinking water and sanitation as a human right derives from the right to an adequate standard of living and is inextricably linked to the right to the highest attainable standard of physical and mental health, as well as the right to life and dignity».

Drinking water being a common good, no human being should be excluded from it¹³.

¹⁰ <https://asprobioagmassociation.fr/2021/04/21/compte-rendu-de-la-conference-sur-limpact-des-migrations-forcees-liees-aux-changements-climatiques-sur-le-droit-international-du-21-avril-2021-de-15-heures-a-16-heures/>

¹¹ - <https://www.cieau.com/connaitre-leau/secheresse-comment-agir/>

¹² -Article L210-1 du code de l'environnement

¹³ <file:///C:/Users/Thierry/Downloads/Proposition%20de%20loi%20n%C2%B0243%20cr%C3%A9ant%20un%20droit%20d%E2%80%99acc%C3%A8s%20au%20r%C3%A9seau%20public%20d%E2%80%99eau%20potable%20pour%20les%20r%C3%A9sidences%20principales.htm>

In terms of drinking water distribution, there is no general obligation to connect to the public water network for owners, municipalities, inter-municipal structures or even operators. According to the provisions of the General Code of Local Authorities, municipalities are responsible for the distribution of drinking water. As such, they establish a drinking water distribution plan which delimits the areas served by the distribution network and therefore ultimately the scope of the areas in which a service obligation applies. These municipalities can, within the framework of a public service delegation, entrust this competence to private operators.¹⁴

It is important to restore the drinking water operating network to a normal operating state

Improving water infrastructure must be a priority, as water conservation and efficiency are key elements of sustainable water management. Solar desalination and smart irrigation systems are excellent examples of clean technologies for water efficiency and control. This obviously applies even more to the agriculture and livestock sector - the largest consumer of water.¹⁵

Rainwater harvesting and wastewater recycling also help reduce scarcity and alleviate pressures on groundwater and other natural water bodies. Groundwater recharge, which allows water to move from surface water to groundwater, is a well-known process to prevent water scarcity.¹⁶

B-Faced with drought and water shortage

¹⁴ <file:///C:/Users/Thierry/Downloads/Proposition%20de%20loi%20n%C2%B0243%20cr%C3%A9ant%20un%20droit%20d%E2%80%99acc%C3%A8s%20au%20r%C3%A9seau%20public%20d%E2%80%99eau%20potable%20pour%20les%20r%C3%A9sidences%20principales.htm>

¹⁵ - <https://solarimpulse.com/penurie-d-eau>

¹⁶ - <https://solarimpulse.com/penurie-d-eau>

On the island of Groix, in southern Brittany, the installation of a watermaker ¹⁷ is on the agenda to anticipate the lack of water in the near future.

The island of Groix is located on the west coast of Morbihan between Belle-Île-en-Mer and the harbor of Lorient. The island in the Atlantic, which stretches 8 km long and 3 km wide, has 2,300 young birds who live year-round on this small rock beaten by the waves.¹⁸

The number of inhabitants of Mayotte is 310,022 people in 2023¹⁹.

The system on the island of Groix must be designed for Mayotte, which has a population 100 times greater.

A temporary seawater desalination site was created in August 2022, in Morbihan. The project was established on the island of Groix, in consultation with the town hall, the prefecture of Morbihan and Lorient Agglomeration, competent in the production and distribution of drinking water on the island. This initiative not only preserves the water used, but also provides it, supplying the municipality with 20 m3 of fresh water per hour (20,000 liters per hour). A significant contribution when the demand for water increases: during the tourist season, water consumption increases by 500 to 1,200 m3 per day. The island of Sein, in Finistère, has been producing its own desalinated water since 1973, because it has no freshwater resources²⁰.

Seawater desalination, a solution to be

¹⁷ - <https://www.tflinfo.fr/environnement-ecologie/video-secheresse-comment-une-ile-s-organise-2228685.html>

¹⁸ - <https://www.golfedumorbihan.bzh/explorer-vannes/decouvrir-vannes/golfe-morbihan/les-iles-du-morbihan/iles-du-golfe-du-morbihan/ile-de-groix/>

¹⁹ - <https://ville-data.com/nombre-d-habitants/mayotte-976-976D>

²⁰ - <https://questions.assemblee-nationale.fr/q16/16-7500QE.htm>

strengthened

The desalination of seawater must be done in compliance with the Barcelona Convention.

The Convention for the Protection of the Mediterranean Sea against Pollution (Barcelona Convention) was adopted on February 16, 1976, in Barcelona and entered into force in 1978.

The Convention was amended in 1995 and renamed Convention for the Protection of the Marine Environment and the Coastal Region of the Mediterranean. Amendments to the Barcelona Convention entered into force in 2004.

The Barcelona Convention and its seven Protocols adopted within the framework of the Mediterranean Action Plan (MAP) constitute the main legally binding regional multilateral environmental agreement covering the Mediterranean.

«The Contracting Parties shall individually or jointly take all appropriate measures in accordance with the provisions of this Convention and the Protocols in force to which they are parties to prevent, reduce, combat and as far as possible eliminate pollution in the Mediterranean Sea Area and to protect and improve the marine environment in this area with a view to contributing to its sustainable development. [...] Contracting Parties shall cooperate with a view to developing and adopting protocols prescribing agreed measures, procedures, and standards for the implementation of the Convention.»²¹

Several techniques have been and are currently used in factories around the world to purify seawater. The main treatment consists of lowering the salt concentration of the water from 35,000 ppm (or 35 g/l) to less than 500 ppm (or 0.5 g/l), the

²¹ - <https://www.unep.org/unepmap/fr/who-we-are/barcelona-convention-and-protocols>

generally accepted potability threshold. Two processes are generally used to separate dissolved salts from water: a thermal process involving evaporation and a membrane process applying the principle of reverse osmosis.²²

The thermal process: distillation

This is the first technique historically used in water desalination, probably due to its simplicity. It consists in evaporating the water, containing the salt, thanks to the heat produced by a boiler or more simply by the sun. Through this process, salts and other dissolved compounds are deposited as water vapor rises. This is then condensed to obtain fresh water.

This technique has the advantage of producing very pure water but the disadvantage of consuming a lot of energy (15kWh/m³ of treated water) and therefore being very expensive. Today, it is only of interest if it is combined with electricity production (cogeneration) (academie-agriculture.fr, 2014). Also, although still very widespread in the Persian Gulf, it is now gradually being abandoned in favor of reverse osmosis.

The membrane process: reverse osmosis

To explain how this process works, it is first necessary to recall the principle of osmosis. Osmosis corresponds to the relationship between a solute (here salt, mainly) and the liquid (here, water) in which it is dissolved. The osmotic pressure is the pressure exerted by the solution (= the liquid + the solute) on the different walls with which it is in contact.

In the case of a system with a semi-permeable membrane, the liquid from the least concentrated solution (here pure water) di-

²² - <https://ecotoxicologie.fr/impacts-dessalement-eau-mer#usines>

lutes the most concentrated solution (salt water) to reach a state of equilibrium called osmotic equilibrium, i.e., an equal salt concentration on either side of the membrane.

The process of reverse osmosis is becoming more and more popular for various reasons. First, this technique consumes much less energy than distillation: only 4 to 5 kWh are needed to treat one cubic meter of water compared to 15 kWh for the thermal process. In addition, these consumptions are tending to drop steadily, thanks to innovations making it possible to recover the energy used to force seawater to pass through the membranes (Energy Recovery Devices, ERD) (paristechreview.com, 2013). Work is also underway to develop much thinner membranes (graphene) which would considerably reduce the pressure required for desalination (futurasciences.com, 2012).

Another advantage of reverse osmosis lies in the possibility of producing large quantities of drinking water (320,000 m³/day in the Ashkelon plant in Israel) and therefore of supplying many people. Finally, the reduction in the cost of membranes and the improved efficiency of pumps and motors are two other positive points.

Reverse osmosis is therefore steadily gaining market share and will become dominant in the future. Most factories built in the last 20 years as well as future projects are based on the use of this technique: in 1990, it represented 40% of installations in the world against around 55% in 2008 and 70% in 2020 (plan bleu, 2008).²³

The impacts of this technique depend on where the seawater is sampled

If the water is taken from coastal wells, the effects on marine ecosystems are re-

duced not only to the catchments (no consequences on the marine fauna and flora), but also to the places of discharge. The water being purer in coastal wells than offshore (sand filtration), it requires less chemical treatment. On the other hand, this option has the disadvantage of not being adaptable to large-scale plants due to the low rate of withdrawal from these wells.

Conversely, if the water is captured offshore, various disturbances of marine ecosystems can be observed, detailed below. To these effects must be added the impacts associated with the pipes used to convey seawater to the plant. These structures, buried in the ground, require special authorization by the competent national authorities (due to the impacts they may cause during their implantation and during their use) according to the "Immersion" protocol of the Barcelona Convention.²⁴

Impacts related to releases

Scientists agree on the fact that the impacts of effluents (= water discharged) from these factories are mainly due to the high concentration of salt and, to a lesser extent, to the presence of chemicals (used for the operation of the factory) and the potentially high temperature of these waters.

Discharges from desalination plants are subject to the regulations of the "Telluric" protocol of the Barcelona Convention, to which many European countries bordering the Mediterranean have adhered: France, Spain, Israel, Egypt, Lebanon, Libya, etc. This agreement provides for discharge limit values for many elements (salts, chlorine, temperature, etc.) and the obligation to carry out an impact study (file examining the environmental consequences of a project) before the construction of the plant.²⁵

²⁴ - <https://ecotoxicologie.fr/impacts-dessalement-eau-mer#environnement>

²⁵ - <https://ecotoxicologie.fr/impacts-dessalement-eau-mer#usines>

Effects of increased salinity and temperature on marine ecosystems

Most organisms can adapt to small variations in temperature and salinity, and even temporarily tolerate extreme conditions; on the other hand, they cannot withstand permanent adverse conditions. The continuous discharge of water with high salinity and high temperature, inducing a decrease in oxygen content, can be fatal for certain organisms and induce a lasting change in the diversity of species and the abundance of the impacted area (Dawoud, 2012).

A study by Mabrouk (1994) thus revealed a disappearance of coral and planktonic organisms and a decrease in fish populations near the discharge from the Egyptian desalination plant in Hurghada, in the Red Sea. Coral reefs present one of the richest environments in the seas and oceans but are indeed very sensitive to variations in environmental conditions, such as an increase in temperature and local water salinity. The same phenomenon has been observed in other discharge areas, such as along the Israeli coast of Aqabat-eilat (Elimelech, 2011).

Other studies have also revealed that these increases in temperature and salinity could also cause a decrease in the diversity and abundance of benthic macrofauna (= organisms living on the bottom).

This is the case, for example, in the discharge zone of the Dhekelia desalination plant (Cyprus). Before the commissioning of the plant, there was a balanced faunal distribution: 27% Polychaetes (a type of worm), 27% Echinoderms (including starfish, sea urchins, etc.), 26% Scaphopods and 20% Gastropods (molluscs). Three years of exploitation later, the population of polychaetes exploded (80% of the benthic fauna) while the populations of other groups of animals drastically reduced (UNEP, 2003).

This study also shows that the popula-

tions of macroscopic algae (which can be observed with the naked eye) of the *Cystoseira barbata* type have decreased and that the microscopic algae have completely disappeared within a radius of 100 meters around the release.²⁶

An environmental impact study will of course be the prerequisite before setting up another desalination system for the department of Mayotte

In Mayotte, where the situation of shortage is the subject of constant vigilance, the project of a second desalination plant is notably planned to alleviate the problem of access to water. An investment of 4.2 million euros has also been committed by the State to improve the performance of the first plant, installed on Petite-Terre. Companies are also investing in the subject, by proposing technological innovations that can remove the ecological brakes of the process, currently considered to be energy-intensive: a French start-up, Mascara, has patented a solution called "Osmosun", a water desalination process that does not emit any greenhouse gases²⁷.

Various desalination solutions without greenhouse gas emissions are already accessible and possible:

- Solution called « Osmosun »

In Moia-Moia in Cape Verde, not a drop of rain has fallen for almost three years. Mascara has installed its autonomous desalination unit there, which produces 50 m3 of clean water per day.²⁸

- Oneka buoys

It was during a trip to Corsica that Dragan Tutic, co-founder of the Canadian company Oneka Technologies had the idea

²⁶ - <https://ecotoxicologie.fr/impacts-dessalement-eau-mer#environnement>

²⁷ - <https://questions.assemblee-nationale.fr/q16/16-7500QE.htm>

²⁸ - <https://www.latribune.fr/technos-medias/start-up/la-startup-mascara-a-mis-au-point-un-procede-de-dessalement-non-polluant-924836.html>

of creating an eco-responsible and inexpensive technology, which uses the movement of the waves to desalinate sea water to produce water for human consumption.

For Oneka – which means water in Mohawk – the premise was simple: to use the ocean which has both resources and energy. There is a lot of energy in the ocean, all you have to do is capture it.

To do this, the company has developed a small desalination device made from 170,000 recycled plastic bottles: floating, autonomous modular systems that use the mechanical energy of the waves to desalinate and pump water to the shore. Anchored to the bottom of the ocean, Oneka buoys float on the surface, between 500 m and 1.5 km from the coast, at any place where the average wave height is greater than 1 m (~3 ft). The oscillating motion of the waves is harnessed to drive a linear water pump. Seawater is pressurized as the buoys rise and is propelled through the treatment system. The water is filtered, desalinated by reverse osmosis and the energy is recovered there before it is released into the sea. Thanks again to the energy of the waves, the fresh and drinkable water is transported to the shore by an underwater high-density polyethylene pipe anchored to the ground. The water can then be stored and/or distributed. The brine discharged by these buoys has a negligible impact on marine fauna and flora because its salt concentration is only slightly higher (+30%) than that of the ocean, in addition to being dispersed by each unit individually.

A zero fuel, zero electricity, zero CO2 emission solution

Iceberg-class units are designed to produce between 30 and 50 cubic meters (8,000 to 13,000 gallons) of water per day, enough to meet the daily needs of 100 to 1,500 people, depending on lifestyle and consumption. On-board sensors, powered by small solar panels, constantly test the wa-

ter produced and ensure that it complies with the standards in force. Oneka offers post-treatment to adjust the taste of the water or to adapt it to the needs of agricultural users.

Democratize access to drinking water

This solution, unlike conventional desalination systems powered by gas and electricity, does not emit significant amounts of greenhouse gases. Each Iceberg-class buoy saves approximately 100,000 kg of CO2 per year. The modular and scalable system allows the number of buoys to be adjusted according to customer needs. Simple, with reduced energy and environmental costs, the Oneka system is available in 3 different sizes. The smallest of them was designed to respond quickly to disaster situations and provide populations in distress with the equivalent of around 2,000 bottles of water per day.²⁹

Freezing the Price of plastic bottles of natural or spring mineral water in the

department is a stopgap measure used to alleviate a critical situation in the face of the drought in Mayotte.

In the face of climate change, the implementation of long-lasting and sustainable solutions is essential.

The project for a second desalination plant planned to alleviate the problem of access to water on the archipelago is an absolute emergency.

Desalination must be done while reconciling respect for marine ecosystems and reduction of greenhouse gas emissions.

References

²⁹ - <https://plastic-lemag.com/Une-solution-de-dessalement-des-oceans-durable>

International and national texts

📄 Convention pour la protection de la mer Méditerranée contre la pollution (Convention de Barcelone) de 1976

📄 Code de l'environnement

Conferences

📄 Compte rendu de la conférence sur « l'impact des migrations forcées liées aux changements climatiques sur le droit international » du 21 Avril 2021 de 15 heures à 16 heures - <https://asprobioagmassociation.fr/2021/04/21/compte-rendu-de-la-conference-sur-limpact-des-migrations-forcees-liees-aux-changements-climatiques-sur-le-droit-international-du-21-avril-2021-de-15-heures-a-16-heures/>

Websites

🔗 <https://www.ladepeche.fr/2019/03/22/quelles-sont-les-consequences-du-manque-dacces-a-leau-potable,8084240.php>, consulté le 22 juillet 2023.

🔗 <https://asprobioagmassociation.fr/2021/04/21/compte-rendu-de-la-conference-sur-limpact-des-migrations-forcees-liees-aux-changements-climatiques-sur-le-droit-international-du-21-avril-2021-de-15-heures-a-16-heures/>

🔗 <https://www.cieau.com/connaitre-leau/secheresse-comment-agir/>

🔗 <https://questions.assemblee-nationale.fr/q16/16-7500QE.htm>

🔗 <https://plastic-lemag.com/Une-solution-de-dessalement-des-oceans-durable>



Image: AdobeStock @ungvar

Water: the new obstacle to building permits in France

FRANCE



By Sabine NDZENGUE AMOA

Legal consultant and speaker specializing in health law, environmental law, public law

<https://sabinendzengueamoiconsulting.fr>

Introduction	27
I-Water restrictions: Means of preserving municipal water resources?	28
A-Slow down tourist activities	28
B- The authorization of the administrative authority: An obligation for any project of installations, works, works or activities (known as "IOTA") likely to reduce the water resource	30
C-Avoid water storage during periods of low pressure?	32
D-Normal water pressure must be maintained to protect a common heritage	32
II- Water: an economic resource and an environmental resource, which must be managed « sustainably »	33
A-European texts on water	33
B-Evolution of water management plans in France	34
III- Is a solution / compromise between water resources and the granting of building permits possible?	36

Abstract

The granting of building permits for tourist activities has given rise to some debate. This situation is inherent to climate change, resulting in summer droughts and water restrictions.

European texts on water; the implementation of water management plans in France aim to make it an economic resource and an environmental resource, which should be managed “sustainably”.

It is essential that the French State and politicians put in place a real solution to reconcile water resources and building per-

mits for tourist activities.

Introduction

Will water be a new obstacle to the granting of building permits in France?

Climate change, with its corollary: drought in summer, is also seeing the emergence of new prohibitions relating to the use of water.

The building permit seems to be in the line of fire.

The drought continues to spread in France and worries. To date, 118 municipalities in Drôme and Ardèche have been recognized as being in a state of natural disaster. In Ardèche, 22 municipalities are subject to a building ban for lack of sufficient water resources. This is a radical measure for the inhabitants of Vallon-Pont-d'Arc (Ardèche), building permits are suspended. A decision by the prefect to try to contain water consumption. "Today, the problem is that we don't know. (...) We were told in March that on April 1, the building permits were suspended and since then we have no concrete information", explains Cyril Amelin, manager of the real estate agency, of which one twenty files are on hold.³⁰

Are water restrictions a means of preserving municipal water resources?

How do water management plans frame this ?

Is a solution / compromise between water resources and the granting of building permits possible?

I-Water restrictions: Means of preserving municipal water resources?

Land that has become unbuildable and an entire sector is impacted. A swimming pool specialist is forced to review his activity and renovate and sell spas to make up for the shortfall. In Ardèche, 22 municipalities are affected by the decree. "It lacks incredible common sense. I don't know what the state is looking for in this context", complains the mayor of Marcols-les-Eaux, François Blache. He has enough water for his town, but in Jaujac, elected officials have

³⁰ https://www.francetvinfo.fr/meteo/secheresse/secheresse-des-communes-ardechoises-interdites-de-construction-faute-d-eau_5805248.html

organized themselves to find solutions. The mayor asked for help from the neighboring village, which allowed her to collect water from its springs.³¹

Law proposals such as the one presented by the deputy Mr. Christophe Naegelen, in 2022 clearly show that the preservation of municipal water resources covers underlying reasons.

A-Slow down tourist activities

Tourist activities are regularly threats to ecosystems. They can also be risk factors concerning the water resources of local populations.

A forward-looking report from the Ministry of Economy and Finance, entitled « The water of the future », published in June 2019, estimates that the average water consumption of a holidaymaker is twice as high as that of a local resident. An increase in the population of holidaymakers in tourist towns therefore results in much higher overall water consumption. In France, according to the same report, 17% of municipalities see their total population at least doubled during the summer tourist season.

The infrastructures necessary for the reception of tourists and vacationers also require, for their construction, to further artificialize the soils of the municipalities. Artificial soils, in addition to their impact on biodiversity, cause strong runoff which prevents the retention of water by the soil and therefore contributes to the aridification of certain tourist areas.

In order to prevent these phenomena from taking on deleterious proportions both for the local inhabitants, the environ-

³¹ https://www.francetvinfo.fr/meteo/secheresse/secheresse-des-communes-ardechoises-interdites-de-construction-faute-d-eau_5805248.html

ment, the water resources, and the tourists themselves, it is a question of curbing the causes at the municipal level.

Being able to limit the establishment of new constructions intended for tourism, such as residences for seasonal rental or second homes, is therefore a necessity for municipalities to be able to face the challenges to come in terms of water management and of the environment.

Establishing a balance between populations, their environment and their tourist activities is fully in line with the objectives set by sustainable development, which are to act more preventively than curatively.

Bill n° 544 « Art. L. 421-6-2. – In municipalities that do not have a local urban plan, a municipal map or an urban planning document in lieu thereof, the mayor may refuse to grant a building permit when the available resources water reach a vigilance threshold decreed by prefectural decree, after consulting the hydrological anticipation and monitoring committee, defined in article D. 213-10-1 of the environment code »³².

This would thus leave the possibility for the mayors of these municipalities to make water an obstacle to the building permit concerning constructions for tourist purposes.

The decision to refuse or grant the building permit would thus only be taken after the opinion of the hydrological anticipation and monitoring committee, defined in article D. 213-10-1³³ of the environment code.; opinion followed by a prefectural decree.

** Role and composition of the hydrological anticipation and monitoring committee

³² - https://www.assemblee-nationale.fr/dyn/16/textes/116b0544_proposition-loi#

³³ https://www.legifrance.gouv.fr/codes/article_lc/LEGIARTI000043504075

Article D213-10-1 of the Environmental Code - Version in force since May 16, 2021

Creation Decree n°2021-588 of May 14, 2021 - art. 1

The Hydrological Anticipation and Monitoring Committee is responsible for the National Water Committee:

1° Discuss and inform on the short and long term hydrological situation in order to support the territories in anticipating the risk of drought, crisis management and the structural reduction of repeated drought phenomena;

2° Propose to the National Water Committee, in the context of climate change, recommendations and preventive or compensatory actions made necessary by the hydrological situation as well as actions intended to structurally reduce the quantitative deficit.

In addition to its Chairman, the Hydrological Anticipation and Monitoring Committee comprises forty-three members appointed by order of the Minister for the Environment, including:

1° Fourteen representatives from the College of the State and its public establishments, including one representative from each of the ministers responsible for agriculture, industry, tourism, youth and sports, local authorities, infrastructure and transport, health, overseas territories, energy, the environment, two directors of water agencies, a representative of the French Office for Biodiversity and a representative of Voies navigables de France ;

2° Twenty-nine members appointed by the National Water Committee under the following conditions :

a) Fourteen representatives appointed within it by the college of local authorities, including the vice-president of the National Water Committee from this college;

b) Fifteen representatives appointed from within it by the college of users, including the two vice-presidents of the National Water Committee, a representative of consumer associations, two representatives of approved environmental protection associations, a representative of water sports, a representative of approved fishing and aquatic environment protection associations, two representatives of chambers of agriculture, a representative of professional freshwater fishing, a representative of inland navigation associations, a representative of sanitation and distribution, a representative of the water distributors under management, a representative of the electricity production industries and a representative of industrial residents.

In addition, other representatives of the State and its public establishments, including representatives of the basin coordinator prefects, Météo-France and the Bureau of Geological and Mining Research, may be associated with this committee to contribute to the characterization of the hydrological situation in the territories and provide their expertise. Representatives of any other organization dealing with short-term and structural water management may also be invited as needed.

B- The authorization of the administrative authority: An obligation for any project of installations, works, works or activities (known as "IOTA") likely to reduce the water resource

The environmental code: in its Article L214-3, specifies that:

I.- Installations, structures, works and activities liable to present dangers to public health and safety, to harm the free flow of

water, to reduce water resources, to significantly increase the risk of flooding, seriously harming the quality or diversity of the aquatic environment, in particular fish stocks.

This authorization is the environmental authorization governed by the provisions of the single chapter of title VIII of book I, without prejudice to the application of the provisions of this title.

II.- Installations, works, works and activities are subject to declaration which, not being likely to present such dangers, must nevertheless comply with the prescriptions enacted pursuant to Articles L. 211-2 and L. 211-3.

Within a time, limit set by decree in Conseil d'Etat, the administrative authority may oppose the proposed operation if it appears that it is incompatible with the provisions of the master plan for water development and management or the water development and management plan, or damages the interests mentioned in Article L. 211-1 of such gravity that no prescription would make it possible to remedy it. Work cannot begin before the expiry of this period. (...) ³⁴

The « water law » file must therefore certify that the project leader has anticipated the impacts of his project and planned to avoid and reduce them, or even to compensate for them.

Any project for installations, works, works or activities (known as "IOTA") having an impact on water and aquatic environments must be the subject of a « water law » file.

1/Reflect on the impacts of my project

Points of vigilance: your reflection must consider the rules:

The accumulation of developments: a

³⁴ - https://www.legifrance.gouv.fr/codes/article_lc/LEGIARTI000042655524

single "water law" file will be submitted if the project provides for several developments on the same catchment area, whether their implementation is simultaneous or successive (R.214-42 and R.214-43 CE);

the accumulation of impacts: the project must consider the accumulation of impacts resulting from the planned developments and works with those resulting from the developments already in place on the site.

2/ Find the sections that concern my project

For each heading of the "water" nomenclature, a project leader must ask himself if his project requires the implementation of the action concerning this heading, in the construction phase as well as in the operating phase. If so, does the action meet the declaration (D) or authorization (A) threshold?

Example: I have a construction project for a housing estate comprising 5-storey buildings with underground parking.

In the construction site preparation phase, I have to check via surveys and measuring instruments at what depth the nearest water table is. I therefore have to drill down to the water table, which submits my project to section 1.1.1.0 (D) of the nomenclature;

During the construction works, I must take from this water table by pumping to lower it, which submits my project to section 1.1.2.0. Depending on the volume withdrawn, I must make a declaration or request an authorization;

It is planned to discharge the water pumped during the works into the nearest watercourse, so my project may be subject to section 2.2.1.0 if this discharge risks modifying the regime of the watercourse, and/or in section 2.2.3.0 if it is polluted.

The construction of my subdivision will

have to provide for the management of rainwater collected on the perimeter of the project, which submits it to section 2.1.5.0;

etc

3/ Comply with the general requirements corresponding to the sections concerned by my project

A certain number of headings of the "water" nomenclature are accompanied by a decree of general prescriptions (APG) that the project must imperatively respect. The water police service will check first and foremost that these prescriptions have been integrated into the "water law" file and then respected in the field when carrying out the IOTA. These APGs can be consulted in the downloadable document below.

Example: I have a project to cover a watercourse over more than 10 meters, which falls under section 3.1.3.0 under declaration (D) because it prevents light from reaching this section of waterways, which can impact the life of aquatic species and therefore the ecosystem present. I must respect the corresponding APG, the obligation to ensure progressive light intensity under the structure to limit the impacts.

4/Consult the existing technical guides for compiling the « water law » file

The section "Water law files: instructions for use" allows you to find out how to compile a "water law" declaration or authorization file. Thus, if your project is subject to "D" and "A", a single authorization file, considering all the headings of the nomenclature, is to be submitted. ³⁵

Are subject to the provisions of Articles L. 214-2 to L. 214-6 installations, works, works and activities carried out for non-domestic purposes by any natural or legal person, public or private, and resulting in wa-

³⁵ - <https://www.drieat.ile-de-france.developpement-durable.gouv.fr/mon-projet-est-il-soumis-a-la-loi-sur-l-eau-a3506.html>

ter withdrawals. surface or underground, restored or not, a modification of the level or mode of flow of water, the destruction of spawning grounds, growth or feeding areas for fish fauna or spills, flows, discharges or direct or indirect deposits, chronic or episodic, even non-polluting.³⁶

C-Avoid water storage during periods of low pressure?

However, one category of citizens still does not have access to drinking water. According to the World Health Organization, 1.4 million French people in mainland France did not have access to safely managed water in 2019.³⁷

Promoters of tourist activities; as well as individuals might be tempted to store huge water reserves to continue their activities.

Water storage: especially during low water periods, is subject to a fee from the water agency.

In application of the principle of prevention and the principle of compensation for damage to the environment, the water agency establishes and collects from public or private persons fees for damage to water resources, the marine environment and biodiversity. , in particular charges for water pollution, for modernization of collection networks, for diffuse pollution, for abstraction from water resources, for water storage during low water periods, for obstacles to watercourses and for the protection of the aquatic environment.

When a person liable in good faith, based on a written, precise and complete presentation of the factual situation, has asked the water agency to take a formal position on the application to his situation of the rules of law provided for in this sub-section,

³⁶ - Article L214-1 of the Environmental Code

³⁷ - https://www.assemblee-nationale.fr/dyn/16/textes/l16b0243_proposition-loi#

tion, the agency responds with reasons within three months. The response is enforceable by the applicant against the agency that issued it until a change in fact or law occurs which affects its validity or until the agency notifies the applicant of a change in its appreciation.³⁸

Is normal water pressure an absolute necessity?

D-Normal water pressure must be maintained to protect a common heritage

Water is part of the nation's common heritage. Its protection, enhancement, and development of usable resources, while respecting natural balances, are of general interest.

The use of water belongs to all within the framework of laws and regulations as well as previously established rights.³⁹

Would a low pressure in the taps be possible to satisfy everyone?

No, this is strictly framed by the French legislator.

The piezometric height of water intended for human consumption distributed by public or private indoor facilities must, at any point of availability, be at least equal to three meters, at peak consumption time (decree of 3.1.89: articles 26 and 33).

The requirement is not very restrictive, it corresponds to a water pressure of 0.3 bars at any point of provision, i.e., up to the general meter, while the pressure at the tap is on average 2 to 3 bars.

The water service regulations available at the town hall may reinforce the obligation

³⁸ - https://www.legifrance.gouv.fr/codes/article_lc/LEGIARTI000006833091/

³⁹ - Ancien article 1 de la Loi n° 92-3 du 3 janvier 1992 sur l'eau

tion of the distributor service.

If the pressure at the tap is not sufficient, the occupying owner or lessor will bear the cost of installing a booster.

As a reminder, in rental accommodation, the lessor must provide "a drinking water supply installation ensuring, inside the accommodation, the distribution with sufficient pressure and flow for the normal use of the tenants"; (decree of 30.1.01).⁴⁰

All this shows the need for sustainable water management.

II- Water: an economic resource and an environmental resource, which must be managed « sustainably »

Europe and the State define the water policy and transcribe it into directives, laws, and regulations.

A-European texts on water

Water quality was a concern in European Union policy very early on. From the 1970s, community legislation focused on the uses of water (drinking water, bathing, fish farming, shellfish farming), then on the reduction of pollution (wastewater, nitrates of agricultural origin). Today, European legislation includes around 30 water directives.

Since 2000, the WFD has been the main

⁴⁰ - <https://www.anil.org/documentation-experte/analyses-juridiques-jurisprudence/analyses-juridiques/analyses-juridiques-2002/eau/-la-pression-de-leau-destinee-a-la-consommation-humaine-fait-elle-objet-dune-reglementation/>

law for the protection of water in Europe. It applies to inland, transitional, and coastal surface waters as well as groundwater. It guarantees an integrated approach to water management, respecting the integrity of all ecosystems, by regulating individual pollutants and setting the corresponding regulatory standards. It is based on a river basin approach to ensure that neighboring countries cooperate to manage the rivers and other water bodies they share.⁴¹

The Water Framework Directive (WFD) of October 23, 2000 (directive 2000/60) aims to give consistency to all this legislation by founding a global community policy in the field of water.

It therefore defines a framework for the management and protection of water by major hydrographic basin with the perspective of the notion of sustainable development.

It imposes four major objectives:

- non-deterioration of the status of groundwater or surface water bodies;
- achievement of good water status in 2015; additional time may be granted (2021,2027) if special circumstances justify it;
- reduction or elimination of pollution by priority substances;
- compliance with other European directives concerning water.
- Thus, the Water Framework Directive (WFD) introduced:
- a global approach to water issues: "good status" is a concept of synthesis defined on the basis of various parameters such as the physico-chemical characteristics of the water, the morphology of the watercourses and the biological quality;

⁴¹ https://environment.ec.europa.eu/topics/water/water-framework-directive_en

- a geographical approach: “good status” is defined for each body of water.

Four territorial scales are thus concerned by the implementation of the WFD.⁴²

B-Evolution of water management plans in France

A review of national water texts is necessary, before reviewing water management plans.

1-National texts on water

The 1964 law was the first reference law organizing decentralized water management by large river basins. Several pieces of legislation were subsequently published. A first overhaul of the various texts took place in 1992 with law n° 92-3 of January 3, 1992, known as the “water law” which relaunched the water policy, which was succeeded by the law on water and aquatic environments (LEMA) of 30 December 2006.

The Water Law of January 3, 1992, included in French regulations the notion of global management of water resources and aquatic environments based on the principle of solidarity between users and the consideration of water in all its forms: vital resource, ecosystem, activity support, etc. It instituted global planning by creating two tools: the SDAGE, Water Development and Management Master Plans and the SAGE, Water Development and Management Plans.

The overall framework of the French water policy defined by the laws of 1964 and 1992 was renovated by Law No. 2006-1772 (LEMA) of December 30, 2006 which reinforces several existing tools with a view to achieving by 2015, the “good status” objective for water set by the European Water

⁴² - LE SCHEMA D’AMENAGEMENT ET DE GESTION DES EAUX DE LA TILLE Une démarche de bassin versant ; https://www.gesteau.fr/sites/default/files/dossier_de_seance.pdf

Framework Directive (WFD).

Thus, the French State has translated the objectives of the WFD into the Water Development and Management Master Plans (SDAGE) which plan water management in the six French river basins and into the Water Development and of Water Management (SAGE).⁴³

2-Water development and management plans in France: Integrated water management

How to reconcile « economic development, regional planning and sustainable management of water resources »? It is in response to this question that the Water Development and Management Schemes (SAGE) were created by the 1992 water law.⁴⁴

The Sdage and the Sage

Several tools enable integrated water management: water development and management master plans (Sdage) and water development and management plans (Sage).

Integrated water management is a process that allows coordinated management of water and associated environments with a view to reconciling water uses and the preservation of ecosystems. It is established and implemented with all the actors concerned (State, elected officials, users).

The Sdage and the Sage are planning documents at the scale of a large river basin (called a river basin) and a sub-river basin respectively. Their objective is to preserve and restore the quality and quantity of wa-

⁴³ - LE SCHEMA D’AMENAGEMENT ET DE GESTION DES EAUX DE LA TILLE Une démarche de bassin versant ; https://www.gesteau.fr/sites/default/files/dossier_de_seance.pdf

⁴⁴ - LE SCHEMA D’AMENAGEMENT ET DE GESTION DES EAUX DE LA TILLE Une démarche de bassin versant ; https://www.gesteau.fr/sites/default/files/dossier_de_seance.pdf

ter resources, to ensure balanced and sustainable management of water resources, to reconcile the satisfaction and development of different uses (drinking water, industry, agriculture ...) and the protection of aquatic environments.

The Sage is a local variation of the Sdage.⁴⁵

⁴⁵ -<https://www.correze.gouv.fr/Action-de-l-Etat/Environnement/Politiques-de-l-eau-et-de-l-environnement/Outils-de-gestion-integree-de-l-eau/Les-Sdage-et-les-Sage>

	Sdage	Sage
Governance body	A basin committee. It develops and follows the Sdage.	A local water commission. It elaborates and follows the Sage
Contenu	It includes : • guidelines for a balanced and sustainable management of water resources; • quality and quantity objectives for the environment; • measures to achieve the objectives set.	It consists of two documents : – a plan for the development and sustainable management of water resources and aquatic environments (PAGD) including: • guidelines for a balanced and sustainable management of water resources; • quality and quantity objectives for the environment; • measures to achieve the objectives set. – a regulation composed of rules to achieve the objectives set in the PAGD.
Related documents	A measurement program (PDM) completes the Sdage. It identifies the main actions to be taken to achieve the objectives set	
Legal scope	Administrative decisions, development documents and programs must be compatible with the provisions of the Sdage (not be in contradiction with them).	Administrative decisions, development documents and programs must be compatible with the provisions of the Sage (not be in contradiction with them). Administrative decisions must comply with the regulations. The rules are enforceable against third parties: any mode of management, project or installation of public or private persons must comply with the rules.

Previous table : Governance of Sdage and Sage, their content and legal scope ⁴⁶

III- Is a solution / compromise between water resources and the granting of building permits possible?

Drôme and Ardèche were recognized as being in a state of natural disaster in May 2023. In Ardèche, 22 municipalities are subject to a building ban due to a lack of sufficient water resources.

Today the Drôme and the Ardèche; tomorrow, in the years to come, it will be other municipalities that will be subject to a building ban due to a lack of sufficient water resources.

« The absence of water or its poor distribution kills ten times more than all wars combined ». World Water Council-2005.⁴⁷

Water, a new obstacle to building permits is a real dilemma in France.

The building permit, this authorization, quite often allows individuals to have access to their property. It also allows tourism operators to develop their tourism activities.

Can the water crisis in France be overcome?

In the United States, in New York in particular, the answers have been found in ecosystems. Indeed, the forest is used as a

⁴⁶ -<https://www.correze.gouv.fr/Action-de-l-Etat/Environnement/Politiques-de-l-eau-et-de-l-environnement/Outils-de-gestion-integree-de-l-eau/Les-Sdage-et-les-Sage>

⁴⁷ - Marie Jeanne Carolle Atontsa ; Droit international de l'environnement et mise en œuvre du droit à l'eau potable en Afrique centrale : le cas du Cameroun, Université de Maastricht ; 2011

tool for water purification⁴⁸.

The mechanism used in New York can be transposed to wealthy cities with a humid climate. It is very important that the French State and politicians preserve and develop forests.

Forests provide and regulate drinking water

Much of the world's drinking water comes from forested areas and millions of people depend on the good quality fresh water that flows from forests. Thus, the forests of the Uluguru Mountains provide drinking water to the 2.5 million inhabitants of the capital of Tanzania, Dar es Salaam. Similarly, 1.3 million people in Quito and 20 million people in Mexico City get their drinking water from mountain forests. Forests help maintain high water quality, influence the volume of water available, and regulate surface and groundwater flows. Forests also contribute to reducing water-related risks such as landslides, floods and droughts and play a preventive role against desertification and salinization.⁴⁹

Forests serve as buffers against extreme weather conditions

Forests have an important buffering capacity through their action of cooling, interception of precipitation and infiltration and retention of water. Forests can therefore mitigate extreme weather events and reduce the impacts of climate change on water resources. In contrast, forests are themselves vulnerable to the effects of climate change such as reduced rainfall or changes in rainfall patterns. Forest managers should aim to reduce the vulnerability

⁴⁸ -Série de documentaires sur 'l'eau, la vie et nous''- épisode 3/ 3 sur ARTE (Etats unis, 2020)

⁴⁹ - <https://www.fao.org/sustainable-forest-management/toolbox/modules-alternative/forest-and-water/basic-knowledge/fr/>

of forests to water stress and increase their capacity to ensure a constant supply of water (see climate change mitigation and adaptation to its effects).⁵⁰

The preservation and development of forests will certainly allow France to avoid making water an obstacle to the granting of building permits; both for individuals and for tourist activities due to the scarcity of the resource.

Bibliography

International texts and conventions

📄 Directive Cadre sur l'Eau (DCE) du 23 octobre 2000 (directive 2000/60)

National laws

📄 Code français de l'environnement

📄 Loi n° 92-3 du 3 janvier 1992 sur l'eau

Studies and Reports

📄 LE SCHEMA D'AMENAGEMENT ET DE GESTION DES EAUX DE LA TILLE Une démarche de bassin versant ; https://www.gesteau.fr/sites/default/files/dossier_de_seance.pdf

Theses and dissertations

📄 Marie Jeanne Carolle Atontsa ; Droit international de l'environnement et mise en œuvre du droit à l'eau potable en Afrique centrale : le cas du Cameroun, Université de Maastricht ; 2011

Websites

🔗 <https://www.correze.gouv.fr/Action-de-l-Etat/Environnement/Politiques-de-l-eau-et-de-l-environnement/Outils-de-gestion-integree-de-l-eau/Les-Sdage-et-les-Sage>

🔗 <https://www.anil.org/documentation-experte/analyses-juridiques-jurisprudence/analyses-juridiques/analyses-juridiques-2002/eau/-la-pression-de-leau-destinee-a-la-consommation-humaine-fait-elle-lobjet-dune-reglementation/>

⁵⁰ - <https://www.fao.org/sustainable-forest-management/toolbox/modules-alternative/forest-and-water/basic-knowledge/fr/>

Re-authorisation of swimming pool water treatment by “Arche Chlorine” in France: What are the prospects for future generations?

FRANCE



By Sabine NDZENGUE AMOA

Legal consultant and speaker specializing in health law, environmental law, public law

<https://sabinendzengueamoaconsulting.fr>

Introduction	40
I-Properties of “Arche Chlorine”	40
A-A biocidal product with the active substance chlorine	40
B-Properties of chlorine	42
II-Normative and regulatory framework for the availability on the market and the use of biocidal products such as “Arche Chlorine” in France	42
A-Community law: Law of the European Union	43
B- Law relating to the use of “Arche Chlorine” in France	44
III-Proven chlorine toxicity	45
A-Regulation of swimming pool water drainage	45
B-Negative effects of chlorine on the environment	46
C-Negative effects of chlorine on health	46
IV-Suggestions to state authorities	48
V-Conclusion	49

Abstract

Will the use of “Arche Chlorine” in France for the treatment of swimming pool water be without consequences for future generations?

The use of “Arche Chlorine” in France is subject to both community legislation (European Union law) and strictly French law.

Political and economic imperatives do not always coincide with people’s interests.

The economic aspect generally prevails in the choice of disinfectant for swimming pools. However,

various studies demonstrate the toxicity of chlorine, the active element contained in “Arche Chlorine”.

Other healthier alternatives should be valued more.

Measures are necessary on the part of the legislator and French politicians to preserve the environment, future generations against the "Chlorine Arche" and chlorine-based biocides.

Introduction

Is “Arche Chlorine” a health hazard? Is there an environmental hazard linked to the use of "Arche Chlorine" in the treatment of swimming pool water in France?

These questions raise crucial issues for the future of our planet, for future generations. They arise even more acutely as: The Order of July 27, 2023, authorizes, by way of derogation, the availability on the market and the use of the biocidal product "Arche Chlorine" in France for a period of 180 days.

The derogation will take effect from November 4, 2023; the day after the product “Arche Chlorine” was withdrawn from the market.

The French State, for several years, has been constantly doing an about-face in the use of products that are dangerous for the environment and for health.

After various derogations, the “neonicotinoids” waltz is coming to an end. France has just given up reauthorizing these insecticides « bee killers »⁵¹.

What about the “Arche Chlorine”?

The product 'Arche Chlorine' is a 'single biocidal product' within the meaning of Article 3(1)(r) of Regulation (EU) No 528/2012, which may be subject to an au-

⁵¹ - https://www.lemonde.fr/planete/article/2023/01/23/neonicotinoides-sous-la-pression-de-la-justice-europeenne-la-france-renonce-a-reautoriser-ces-insecticides-tueurs-d-abeilles_6159014_3244.html

thorization from the Union pursuant to Article 42(1) of that Regulation.⁵²

The use and effects of "Arche Chlorine" deserve to be examined to verify its compatibility with environmental and health requirements.

Faced with a growing concern for the protection of the environment, for sustainable development, it is necessary to examine the properties of the “Arche Chlorine” (I); the legal framework governing the use of “Arche Chlorine” in France (II); the demonstrated and recognized toxicity of chlorine (III); and in the face of all these elements, make suggestions to the state authorities (IV).

I-Properties of “Arche Chlorine”

What does the “Chlorine Ark” represent?

A-A biocidal product with the active substance chlorine

A biocidal product destroys micro-organisms.

The biocidal product "Arche Chlorine" is used as a water disinfectant for product type (PT) 2 or PT 5 in dedicated facilities, often on a large scale, and managed only by professionals (trained).⁵³

The active substance contained in the product "Arche Chlorine" is active chlorine

⁵² - <https://eur-lex.europa.eu/legal-content/FR/TXT/?uri=CELEX%3A32023R0754>

⁵³ -European Chemicals agency (ECHA), Opinion of the Biocidal Products Committee on the Union authorisation of the biocidal product Arche Chlorine. https://www.echa.europa.eu/documents/10162/3443008/arche_chlorine_final_bpc_opinion_en.pdf/26f019dc-9cf6-66a4-7374-31179c98fad0?t=1646811004398

Number	Product type	Description
TP2	Disinfectants and algaecides not intended for direct application to humans or animals	Used to disinfect surfaces, materials, equipment, and furniture that are not used in direct contact with food or animal feed. Places of use include, but are not limited to, swimming pools, aquariums, pond water and other water, air conditioning systems, as well as walls and floors in private, public and industrial places and other places of activity professionals. Used to disinfect air, water not used for human or animal consumption, chemical toilets, sewage, hospital waste and soil. Used as algaecide products for the treatment of swimming pools, aquariums, and other waters, as well as for the curative treatment of building materials. Used for incorporation into textiles, fabrics, masks, paints and other articles or materials, to produce treated articles with disinfectant properties.
TP5	Disinfectants and algaecides not intended for direct application to humans or animals	Used to disinfect surfaces, materials, equipment and furniture that are not used in direct contact with food or animal feed. Places of use include, but are not limited to, swimming pools, aquariums, pond water and other water, air conditioning systems, as well as walls and floors in private, public, and industrial places and other places of activity professionals. Used to disinfect air, water not used for human or animal consumption, chemical toilets, sewage, hospital waste and soil. Used as algaecide products for the treatment of swimming pools, aquariums, and other waters, as well as for the curative treatment of building materials. Used for incorporation into textiles, fabrics, masks, paints and other articles or materials, to produce treated articles with disinfectant properties. ⁶⁶

⁶⁶ - <https://echa.europa.eu/fr/regulations/biocidal-products-regulation/product-types>

released from chlorine, which is included in the Union list of approved active substances referred to in Article 9(2) of Regulation (EU) No 528/2012 for product types 2 and 5.⁵⁴

Description of product types (TP) 2 and 5 : refer to the previous table

B-Properties of chlorine

Uses

Chlorine is used as:

- raw material for the synthesis of many organic and mineral compounds,
- bleaching agent in stationery,
- disinfection and sterilization agent (water treatment).

Chlorine is also likely to be released during industrial operations such as the oxidation of hydrogen chloride or the pyrolysis of chlorine compounds.

Physical properties

At room temperature and atmospheric pressure, chlorine is a greenish-yellow gas, heavier than air, with a pungent and suffocating odor, perceptible at less than 1 ppm. It is sold liquefied under its own saturated vapor pressure.

Chlorine is poorly soluble in water (0.7 g/100 mL at 20°C).

The triple point of chlorine is -101°C at 1.4 kPa.

The density of the liquid is 1.405 g/cm³ at 20°C and 569 kPa (saturation pressure).

Chemical properties

Chlorine is a very reactive oxidant. It

reacts with water or in the presence of humidity, with the formation of hydrochloric and hypochlorous acids.

Mixtures of chlorine with hydrogen, acetylene, ethane, ethylene, and ammonia can explode under the action of a spark, light or certain catalysts.

The product reacts violently (up to ignition and explosion) with many organic compounds, as well as with phosphorus, arsenic, antimony, and finely divided metals.

There is also a risk of violent ignition when in contact with greases, oils, and silicons.

At temperatures below 120°C, anhydrous chlorine does not act on common metals and alloys (on the other hand, it attacks titanium, which ignites spontaneously). Wet chlorine corrodes most metals at room temperature (except titanium and tantalum).⁵⁵

How is the marketing and use of "Arche Chlorine" regulated in France?

II-Normative and regulatory framework for the availability on the market and the use of biocidal products such as "Arche Chlorine" in France

The availability on the market and the use of biocidal products like "Arche Chlorine" in France is regulated both by European Community law (A) and by French legislation (B).

⁵⁵ - https://www.inrs.fr/publications/bdd/fichetox/fiche.html?refINRS=FICHETOX_51&section=caracteristiques

⁵⁴ - <https://eur-lex.europa.eu/legal-content/FR/TXT/?uri=CELEX%3A32023R0754>

A-Community law: Law of the European Union

Two texts regulate the availability on the market and the use of biocidal products in Europe:

a-Regulation (EU) No 528/2012 of the European Parliament and of the Council of May 22, 2012

It concerns the making available on the market and the use of biocidal products.

Regulation (EU) No 528/2012⁵⁶ of the European Parliament and of the Council of 22 May 2012 aims to improve the free movement of biocidal products in the Union while guaranteeing a high level of protection of human and animal health and the environment. Particular attention should be paid to the protection of vulnerable groups of the population, such as pregnant women and children. This Regulation should be based on the precautionary principle to ensure that the manufacture and making available on the market of active substances and biocidal products does not have harmful effects on human or animal health or unacceptable on the environment. To remove, as far as possible, barriers to trade in biocidal products, rules should be laid down for the approval of active substances and for the making available on the market and use of biocidal products, including rules on mutual recognition of authorizations and parallel trade.

The regulation is made under the Treaty on the Functioning of the European Union, and in particular its article 114.

b- The TFEU, Treaty on the Functioning of the European Union

⁵⁶ - <https://eur-lex.europa.eu/legal-content/FR/TXT/PDF/?uri=CELEX:32012R0528>

The Treaty on the Functioning of the European Union⁵⁷, in its consolidated version of October 26, 2012, intends to confirm the solidarity which binds Europe and the overseas countries, and wishing to ensure the development of their prosperity, in accordance with the principles of the charter of the United Nations.

Article 114 relates to national provisions which derogate from a harmonization measure, particularly in terms of public health and the environment.

"1. Unless the Treaties provide otherwise, the following provisions shall apply for the achievement of the objectives set out in Article 26. The European Parliament and the Council, acting in accordance with the ordinary legislative procedure and after consulting the Economic Committee and social, adopt measures relating to the approximation of the laws, regulations and administrative provisions of the Member States which have as their object the establishment and functioning of the internal market.

2. Paragraph 1 shall not apply to tax provisions, provisions relating to the free movement of persons and those relating to the rights and interests of employees.

3. The Commission, in its proposals provided for in paragraph 1 regarding health, safety, environmental protection and consumer protection, shall take as a basis a high level of protection, taking account in particular of any new development based on scientific facts. Within their respective competences, the European Parliament and the Council also strive to achieve this objective.

4. If, after the adoption of a harmonization measure by the European Parliament and the Council, by the Council or by the Commission, a Member State considers it

⁵⁷ - <https://eur-lex.europa.eu/legal-content/FR/TXT/PDF/?uri=CELEX:12012E/TXT>

necessary to maintain national provisions justified by important requirements referred to in Article 36 or relating to the protection of the environment or the working environment, it notifies them to the Commission, indicating the reasons for maintaining them.

5. Furthermore, without prejudice to paragraph 4, if, after the adoption of a harmonization measure by the European Parliament and the Council, by the Council or by the Commission, a Member State considers it necessary to introduce provisions measures based on new scientific evidence relating to the protection of the environment or the working environment due to a problem specific to that Member State, which arises after the adoption of the harmonization measure, it shall notify the Commission the measures envisaged as well as the reasons for their adoption. C 326/94 EN Official Journal of the European Union 26.10.2012

6. Within six months of the notifications referred to in paragraphs 4 and 5, the Commission shall approve or reject the national provisions in question after verifying whether they are a means of arbitrary discrimination or a disguised restriction on trade between States Member States and whether they constitute an obstacle to the functioning of the internal market. In the absence of a decision by the Commission within this period, the national provisions referred to in paragraphs 4 and 5 shall be deemed to have been approved. Where justified by the complexity of the matter and where there is no danger to human health, the Commission may notify the Member State in question that the period referred to in this paragraph may be extended by a further period which may go up to six months.

7. Where, pursuant to paragraph 6, a Member State is authorized to maintain or introduce national provisions derogating from a harmonization measure, the Com-

mission shall immediately examine whether it is appropriate to propose an adaptation of that measure.

8. When a Member State raises a particular public health problem in an area which has previously been the subject of harmonization measures, it shall inform the Commission, which shall immediately examine whether it is necessary to propose appropriate measures. to the Council.

9. By way of derogation from the procedure provided for in Articles 258 and 259, the Commission and any Member State may refer the matter directly to the Court of Justice of the European Union if they consider that another Member State is misusing the powers provided for in this article. 10. The harmonization measures referred to above shall include, in appropriate cases, a safeguard clause authorizing Member States to take, for one or more of the non-economic reasons referred to in Article 36, provisional measures subject to a Union control procedure."

French legislation complements European regulations.

B- Law relating to the use of "Arche Chlorine" in France

In France, various other texts complement European Community legislation.

a - Environmental code

Article R522-6 of the Environmental Code governs the granting of exemptions.

The derogations mentioned in paragraph 1 of Article 55 of Regulation (EU) No 528/2012 of 22 May 2012 are issued by the Minister responsible for the environment who, except in an emergency, consults the National Agency beforehand.

In the absence of a response from the

Minister at the end of a period of three months from the receipt of a request for derogation mentioned in the first paragraph, this request is deemed to have been rejected.

The decisions issued by the Minister are transmitted to the National Agency to be made public under the conditions provided for in Article R. 522-5.

b - Decrees

Orders can be issued by the Minister responsible for the environment.

The Minister responsible for the environment may authorize, by decree, the making available on the market or the use of a prohibited biocidal product under the conditions provided for in Article 55 of Regulation (EU) No 528/2012 of the European Parliament and of the Council of 22 May 2012, cited above, when this is strictly necessary for the protection of the health and life of humans and animals and for the protection of plants and in accordance with the pursuit of a legitimate aim of 'general interest. (Article L522-10 of the Environmental Code).

III-Proven chlorine toxicity

Since chlorine is the active substance contained in the product "Arche Chlorine", it is necessary to observe its negative effects on health and the environment.

A preliminary examination of the evacuation of swimming pool water is essential.

A-Regulation of swimming pool water drainage

Prohibition of introduction into wastewater collection systems

It is prohibited to introduce into the wastewater collection systems:

a) Directly or through building pipes, any solid, liquid or gaseous matter likely to be the cause either of a danger for the operating personnel or for the inhabitants of the buildings connected to the collection system, either from a deterioration of the sanitation and treatment works, or from a problem in their operation;

b) Solid waste, including after shredding;

c) Spring water or underground water, including when it has been used in thermal treatment installations or air conditioning installations;

d) Drainage water from swimming pools.

However, municipalities acting pursuant to Article L. 1331-10 may derogate from c and d of the preceding paragraph provided that the characteristics of the collection and treatment works allow it and that the discharges have no influence on the quality of the environment receiving the final discharge. Derogations may, as necessary, be granted subject to pre-treatment before discharge into the collection systems.⁵⁸

Any discharge of wastewater other than domestic into the public collection network must be authorized in advance by the mayor

Any discharge of wastewater other than domestic into the public collection network must be authorized in advance by the mayor or, when jurisdiction over collection at the site of the discharge has been transferred to a public institution for inter-municipal cooperation or to a mixed syndicate, by the president of the public establishment or the

⁵⁸ - Article R1331-2 of the Public Health Code; https://www.legifrance.gouv.fr/codes/article_lc/LEGIARTI000006909904

mixed syndicate, after notice issued by the public body in charge of the transport and purification of waste water as well as the treatment of sludge downstream, if this authority is different. To formulate an opinion, the latter has a period of two months, extended by one month if it requests additional information. In the absence of an opinion given within the time allowed, it is deemed to be favourable.

Failure to respond to the request for authorization more than four months after the date of receipt of this request is deemed to be rejection of the request.

The authorization provided for in the first paragraph fixes in particular its duration, the characteristics that the wastewater must have to be discharged and the conditions for monitoring the discharge.

Any subsequent modification in the nature or quantity of wastewater discharged into the network is authorized under the same conditions as those provided for in the first paragraph.

The authorization may be subject to the contribution of the author of the discharge to the investment expenses entailed by the reception of these waters.

This participation is added, where applicable, to the fees mentioned in article L. 2224-12-2 of the general code of local authorities and to the sums that may be due by the interested parties under articles L. 1331-2, L. 1331-3, L. 1331-6, L. 1331-7, and L. 1331-8 of this code.⁵⁹

What are the negative effects of chlorine on the environment?

⁵⁹ - Article L1331-10 du Code de la santé publique https://www.legifrance.gouv.fr/codes/section_lc/LEGITEXT000006072665/LEGISCTA000006171062/#LEGISCTA000006171062

B-Negative effects of chlorine on the environment

Due to its reactivity, chlorine is not likely to move through the soil and enter groundwater.

Plants and animals are not likely to store chlorine. However, laboratory studies have shown that repeated exposure to chlorine in the air can affect the immune system, blood, heart, and respiratory system of animals.

Chlorine causes environmental damage at low concentrations. Chlorine is especially harmful to organisms living in water and soil.

Chlorine dissolves when mixed with water. It can also extract itself from water and end up in the air under certain conditions. Most direct releases of chlorine to the environment are to air and surface waters.

Once in the air or water, chlorine reacts with other chemicals. They combine with inorganic elements to form chloride salts and with organic compounds to form chlorinated organics.⁶⁰

C-Negative effects of chlorine on health

Chlorine is a very reactive gas. It is an element that is easily found in nature. The largest users of chlorine are companies that manufacture ethylene dichloride and other chlorinated solvents, polyvinyl chloride (PVC) resins, chlorofluorocarbons, and propylene oxides. Paper mills use chlorine to bleach paper. Water and sewage treatment plants use chlorine to reduce the number of micro-organisms that can spread diseases to humans in water (disinfection).

People can be exposed to chlorine in the

⁶⁰ - <https://www.lenntech.fr/data-perio/cl.htm>

workplace or in the environment following releases to the air, water, or soil. People who use clothing bleach or pool chemicals that contain chlorine products are generally not exposed to the chlorine itself. In general, chlorine is found within the framework of industry.

Chlorine can be absorbed by inhalation when breathing contaminated air or by ingestion when drinking contaminated water or food. It does not stay in the body due to its reactivity.

The health effects of chlorine depend on the amount of chlorine present and the length and frequency of exposures. They also depend on the person's health or the environmental conditions when exposure occurs.

Breathing small amounts of chlorine for short periods affects the respiratory system. This can range from coughing and chest pain to fluid retention in the lungs. Chlorine irritates the skin, eyes, and respiratory system. These effects are not likely to develop at chlorine concentrations normally found in the environment.

The health effects of taking in small amounts of chlorine over a long period of time are not known. Some studies show that workers develop certain problems with repeated inhalation exposures, and others do not.⁶¹

Water contaminated with chlorine can cause several health problems, including:

Increased risk of cancer

According to a report by the American Council on Environmental Quality, the risk of cancer

for people who drink chlorinated water is up to 93% higher than for those whose water does not contain chlorine. Scientists claim that other chlorine by-products also

⁶¹ - <https://www.lenntech.fr/data-perio/cl.htm>

play a role in cancer. These chlorine by-products trigger the production of free radicals in the body, leading to carcinogenic cell damage. Although the concentration of these products is relatively low, scientists believe that they are responsible for most cancers in the United States.

In other studies, rodents exposed to chloramines and chlorine developed tumors in the intestines and kidneys. If exposed to the skin, chlorine contaminated water can cause irritation and burn the skin.

Cell damage

Chlorine can be described as a pesticide whose sole purpose is to cause harm to living organisms.

Drinking water contaminated with chlorine destroys cells and tissues inside our body. This explains the carcinogenic behavior of chlorine.

Increases the risk of asthma

Drinking chlorine-contaminated water and swimming in chlorinated pools increases the risk of respiratory problems, such as asthma, especially in children. Showering and bathing in chlorinated water can also increase the risk of eczema in children. Showering with unfiltered water can also cause the following symptoms:

- Sneezing
- Chest tightness
- Cough
- weak Mild sore throat
- Increased dryness of the throat
- Irritation of the nasal passages
- Cause heart problems

Chlorine added to your water supply can pose serious threats to your cardiovascular health. The scientist, Dr. Joseph Price, performed a test. He used two groups of chick-

ens as test subjects to discover the root cause of atherosclerosis which ultimately leads to strokes and heart attacks. One group of chickens were given chlorine-contaminated water to drink while the other was given chlorine-free water.

The results confirmed that all the chickens that drank the contaminated water had some level of heart and circulatory disease. During the winter, these chickens additionally exhibited symptoms of poor health, such as poor circulation, reduced activity, and chills. The group that went without chlorine grew much faster and displayed vigorous health.⁶²

IV-Suggestions to state authorities

It is recurrent that French politicians and legislators rely on comfort solutions.

These makeshift solutions do not necessarily correspond to the imperatives of environmental protection and the health of future generations.

The proven negative effects of chlorine, particularly on health, should perhaps lead French legislators and politicians to reconsider the use of “Arche Chlorine” in a comprehensive way.

The cost of the investments to be made to replace the current water treatment system of many public swimming pools equipped with gaseous chlorination installations cannot always be taken as justification.

Long-term solutions must be taken.

Alternatives to chlorine-based products :

Ozone treatment: appreciated by

⁶² - <https://freshwater.es/chlorine.html>

collective swimming pools

To create the chemical reaction necessary for an ozone treatment, an ozonator is placed in the technical room of the swimming pool. Its purpose is to suck in oxygen and transform it into an odorous and oxidizing gas (ozone), either by an electric field or by a UV lamp depending on the ozonator chosen. The ozone is then released into the dirty water to disinfect it, before returning clean, clear water to the pool, with twice the effectiveness of chlorine.

Ozone treatment makes water pleasant, eliminates odors and gives a good taste (it is also used to disinfect drinking water). This is why it is very popular with public swimming pools, which can more easily amortize its high acquisition cost.⁶³

Magnesium treatment (Magna-Pool®): the most recent

This Zodiac innovation is based on two processes: on the one hand, stones made up of magnesium chloride and potassium chloride, which provide treatment in the water, and on the other hand, a new filter media called Hydroxinator which contains pure glass crystals, called Crystal Clear®.

This system offers healthy and ecological water without any other chemicals. Above all, it enriches the pool water with minerals, giving it properties against muscle pain and stress.⁶⁴

Bromine: From the same family as chlorine, but healthier

Bromine belongs to the same family as chlorine: the halogens. It is however much healthier than its cousin, since it does not present any aggressiveness for the eyes, the

⁶³ - <https://www.piscine-global-europe.com/fr/actualites/innovations/alternatives-chlore-pour-traiter-eau-piscine>

⁶⁴ - <https://www.piscine-global-europe.com/fr/actualites/innovations/alternatives-chlore-pour-traiter-eau-piscine>

skin, and the mucous membranes of swimmers. Moreover, it is completely odorless. It is much less sensitive to UV and heat (and is therefore often used in spas) and therefore does not require a stabilizer. In addition, unlike most disinfectants, it varies little with pH: it is still 80% effective when the pH is 8.⁶⁵

V-Conclusion

Highlighting the issues raised by the “Chlorine Arche” and the dangers it represents for health and the environment shows some of the challenges to which future gen-

⁶⁵ - <https://blog.swimmy.fr/analyser-et-traiter-eau-piscine/piscine-sans-chlore/>

erations are subject in France.

Modestly, this article has attempted to unveil the global contours of the “Chlorine Ark”. Rethinking the use of “Arche Chlorine” through the prism of protecting the environment and safeguarding future generations is an absolute emergency.

This requires revisiting not only its use, but also the legal principles that govern its use.

The earth is our common home. Our survival depends on the sustainable use and protection of the resources we have.

Bibliography

European texts

📄 Traité sur le fonctionnement de l'Union Européenne, Version consolidée du 26.10.2012

📄 Règlement d'exécution (UE) 2023/754 de la commission du 12 avril 2023 accordant une autorisation de l'Union pour le produit biocide unique dénommé « Arche Chlorine » conformément au règlement (UE) no 528/2012 du Parlement européen et du Conseil

📄 Règlement d'exécution (UE) 2023/1144 de la commission du 9 juin 2023 accordant une autorisation de l'Union pour le produit biocide unique dénommé « Bactacid IPA-N » conformément au règlement (UE) no 528/2012 du Parlement européen et du Conseil

National texts

📄 Code de l'environnement

📄 Code de la santé publique

Articles

📄 Joël Lagiere, Nasma Hamdi El Najjar, Karine Dubourg, Sébastien Labarthe et Céline Ohayon, La chimie du brome appliquée à la désinfection des eaux de piscines : étude bibliographique ; Revue des sciences de l'eau / Journal of Water Science Volume 30, numéro 3, 2017, p. 171-258.

Court decisions

📄 Cour de Justice de l'Union Européenne ; Arrêt de la Cour dans l'affaire C-162/21 | Pesticide Action Network Europe e.a. ; Communiqué de presse n° 12/23 ; Luxembourg, le 19 janvier 2023

Websites

🔗 https://www.lemonde.fr/planete/article/2023/01/23/neonicotinoides-sous-la-pression-de-la-justice-europeenne-la-france-renonce-a-reautoriser-ces-insecticides-tueurs-d-abeilles_6159014_3244.html

🔗 <https://freshwater.es/chlorine.html>

🔗 https://www.inrs.fr/publications/bdd/fichetox/fiche.html?refINRS=FICHETOX_51&section=caracteristiques

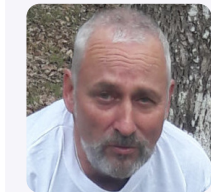
🔗 <https://blog.swimmy.fr/analyser-et-traiter-eau-piscine/piscine-sans-chlore/>

🔗 <https://www.piscine-global-europe.com/fr/actualites/innovations/alternatives-chlore-pour-traiter-eau-piscine>



Image: Flickr @Daniel Chodusov

Cambodia: Tonle sap lake, an ecosystem to be preserved for present and future generations



By Thierry NOËL

Former Safran logistics technician; Secretary General of the ASPROBIO AGM association

Introduction	53
A - A source of survival for many Cambodians	53
survival for many Cambodians	54
B - Endangered species	54
C - An ecosystem in danger	54
Ecological restoration of Wolong Lake can be applied to Tonle Sap Lake	54
Restoration by the ecosystem approach	55
Conclusion	55

Introduction

Climate change and human action can have disastrous consequences on aquifer and fishery resources.

This is the case of Tonle sap lake in Cambodia.

Since its recognition as a biosphere reserve by UNESCO in 1997, this Cambodian resource has experienced a decline that is not about to stop.

Drought and the Tonle Sap dams are jeopardizing the swamp forests and fish resources, the country's main sources of protein. Dull, dry, treeless farmland now stretches as far as the eye can see. Fires, of-

ten intentionally started to clear land, have further reduced the extent of the forest.⁶⁷

Are this lake and its flora and fauna doomed to a certain end?

If no major action is taken, this biosphere reserve is doomed to disappear.

A - A source of

⁶⁷ - <https://www.nationalgeographic.fr/environnement/2020/08/le-plus-grand-lac-du-cambodge-est-en-train-de-se-dessecher-menacant-forets-et>

survival for many Cambodians

A good half of Cambodia's protein needs came from the annual catch of over 250,000 tonnes⁶⁸.

Fish is indeed an excellent source of protein.

Fish, like meat, is an excellent source of protein. They are classified either according to their origin or according to their lipid content.

They also provide vitamins, minerals and the precious omega-3s that are often lacking in our diet. These are polyunsaturated fatty acids beneficial to health, especially for the cardiovascular system.

Main contributions:

- Complete proteins
- Minerals: selenium, iodine
- Vitamins D
- Essential fatty acids: omega-3⁶⁹

B - Endangered species

The immense diversity of its flora and fauna includes an exceptional number of globally endangered animals, birds, and reptiles.⁷⁰

Back then, during the six-month rainy season, this wetland became a feeding and breeding ground for a wide variety of fish, including the endangered *Pangasianodon gigas*.⁷¹

⁶⁸ - Paul Everingham, Le succès de la réserve de biosphère Tonlé Sap, in Revue du patrimoine mondial: numéro spécial, 2013 ; P110

⁶⁹ - <https://www.fitadium.com/conseils/poissons/>

⁷⁰ - Paul Everingham, Le succès de la réserve de biosphère Tonlé Sap, in Revue du patrimoine mondial: numéro spécial, 2013 ; P110

⁷¹ <https://www.nationalgeographic.fr/>

C - An ecosystem in danger

According to Global Forest Watch, Cambodia lost a quarter of its entire forest cover, or more than 20,000 square kilometers, between 2001 and 2019. A rate much higher than that of Brazil, for example, and significantly greater than any other Asian countries.

In 2016, during the dry season, a fire ravaged 80% of the flooded forest, destroying fish habitats and causing many of the 13,000 inhabitants living in floating houses to give up fishing. They are now growing chilli, among other things.

Deforestation and environmental degradation could have dramatic economic consequences for the million Cambodians who live around the lake and the millions of others who depend on the region for food, fish being the main source of protein for the country.⁷²

D - The restoration of Tonle sap lake is possible

Swamp when water is lacking, lake when there is plenty of water, Tonle Sap Lake must find some stability.

Ecological restoration of Wulong Lake can be applied to Tonle Sap Lake

A 7.8 km dyke equipped with valves was

[environnement/2020/08/le-plus-grand-lac-du-cambodge-est-en-train-de-se-dessecher-menacant-forets-et](https://www.riedd.org/2020/08/le-plus-grand-lac-du-cambodge-est-en-train-de-se-dessecher-menacant-forets-et)

⁷² <https://www.nationalgeographic.fr/environnement/2020/08/la-banquise-arctique-pourrait-disparaitre-dici-2035>

built to allow differentiated management of water resources according to the different functions of the lake. Technical support was provided for fine management of water levels and for monitoring migratory bird populations. Thirty-six small islands serving as habitat for birds have been created.⁷³

Restoration by the ecosystem approach

The ecosystem approach is based on examining the interactions between water, the biocenosis,

the atmosphere, the watershed, and human populations (BARICA, 1993) and addresses all the problems affecting the lake.

The ecosystem approach is also the most difficult to put into practice since it often involves the direct participation of the population and requires in-depth knowledge of the ecosystem.

This approach relies, among other things, on changes in people's habits (REYNOLDS, 1993). The means can vary from a simple incentive program to a complete moratorium on the residential development of a lake basin:

Prohibition of the use of motorized boats, preservation of a buffer zone around the lake, awareness of citizens about their septic system and possible measures for the preservation of the lake, etc. In terms of contamination, public awareness of toxic products. We can also note the efforts made with residents to make them aware of the impact of the use of fertilizers with or without pesticides, and of the discharge of oils, paints and other domestic toxic substances into lakes, sewers, or Septic⁷⁴.

⁷³ - <https://www.afd.fr/fr/carte-des-projets/restauration-ecologique-lac-wulong-contribution-majeure-preservation-biodiversite-chine>

⁷⁴ - J. Dupont, La restauration des lacs au Québec : un défi face aux problèmes environnementaux

Conclusion

The Tonlé Sap is a generous lake, a sanctuary for Cambodian flora and fauna to be preserved.

With its humid forest, it sequesters more carbon than a dry forest. It is essential to save and preserve this biodiversity reserve, an excellent carbon storage sink, a source of living water.

actuels, Revue des sciences de l'eau, Volume 10, numéro 1, 1997.

Bibliography

TV shows

Dans tes yeux ; S02 : Cambodge : Tonlé Sap ; Documentaire De Ludovic Tourte ; Année de production 2013

La vie secrète des lacs ; Le lac Tonlé Sap, le coeur battant du Cambodge ; Arte ; Réalisation

De Bernard Guerrini et Mathias Schmitt. Année de production, 2014. <https://org-www.arte.tv/fr/videos/048886-003-A/la-vie-secrete-des-lacs/>

Articles

📖 J. Dupont, La restauration des lacs au Québec : un défi face aux problèmes environnementaux actuels, Revue des sciences de l'eau, Volume 10, numéro 1, 1997.

📖 Paul Everingham, Le succès de la réserve de biosphère Tonlé Sap, in Revue du patrimoine mondial : numéro spécial, 2013 ; P110

Web sites

🔗 https://unesdoc.unesco.org/ark:/48223/pf0000220956_fre

🔗 <https://www.nationalgeographic.fr/environnement/2020/08/le-plus-grand-lac-du-cambodge-est-en-train-de-se-dessecher-menacant-forets-et>



Image: AdobeStock @Riccardo Niels Mayer

PUBLIC PARTICIPATION AND INTEGRATED WATER RESOURCE MANAGEMENT IN CENTRAL AFRICA



By Michele Désirée OKALA ABEGA

PhD in International Relations

Assistant Teacher at the University of Yaoundé II

Coordinator of the Réseau Eau et Climat des Organisations de Jeunes d'Afrique centrale (RECOJAC); Head of the environment department within the l'Association des Femmes de l'eau, assainissement et Environnement du Cameroun (AFPEEC).

Michle_okala@yahoo.fr

Introduction	60
A-The political commitment of government authorities: prerequisite for the organization of public participation	62
1-The organization of participation in the water sector: The contribution of national governmental authorities	62
2-Coordination between national government authorities: towards the effectiveness of public participation in the water sector at the national level	64
B-Participation of private companies, citizens, and disadvantaged populations in water management in Central Africa: between hesitation and imperative...	66
1 - Participation of private companies and citizens: developing a framework	67
2-Participation of vulnerable populations: concern for representativeness	70
Conclusion	72

Abstract

Public participation is an important aspect in integrated water resources management. It is a process by which stakeholders influence and control development initia-

tives as well as the decisions that concern them. This article aims to question the organization of public participation in the water sector in Central Africa. The mobiliza-

CENTRAL AFRICA

tion of (primary) resources, interviews, the use of the democratic approach to participation and the theory of political participation allows us to see that the implementation of participation requires defining a participation strategy, which is not yet the case in Central Africa where countries shine with « spontaneism » . Much remains to be done to systematize public participation in the water sector in Central Africa, a condition for proper adaptation to the principles of IWRM.

Keywords: Public participation – IWRM – water – democracy - Central Africa

Introduction

One of the important aspects of democracy is giving citizens the opportunity to participate in the decision-making processes of public authorities. In the environmental field, public participation in decision-making processes and access to justice in environmental matters has been the subject of an international agreement, known as the "Aarhus Convention"⁷⁵ (city of Denmark) signed in 1998 by 39 countries ⁷⁶. In

⁷⁵ The Aarhus Convention on access to information, public participation in decision-making and access to justice in environmental matters signed on June 25, 1998, by 39 States is an international agreement aimed at "environmental democracy ". Its objective is to improve environmental information, promote public participation in decision-making having an impact on the environment and extend the conditions of access to justice in matters of environmental legislation and access to information. Prieur M, The Aarhus Convention, universal instrument of environmental democracy, environmental legal review, 1999.

⁷⁶ MICHELOT Agnès., « La construction du principe de participation : réflexions autour de la convention d'Aarhus sur l'accès à l'information, la participation du public au processus décisionnel et l'accès à la justice en matière d'environnement », La démocratie environnementale. Participation du public aux décisions et politiques environnementales, Éditions universitaires de Dijon, collection Sociétés, Dijon, 2009 p. 11.

addition, the Agenda 21 plan says that to achieve integrated water resources management (IWRM), it is necessary: « Design, implement and evaluate projects and programs that are both economically profitable and socially appropriate, within the framework of clearly defined strategies based on the full participation of the public, in particular that of women, youth, indigenous populations and local communities, policy development and water management decisions ⁷⁷ ». There are two approaches that have an ontological disagreement on participation because one is rooted in theories of democracy, and the other in those of the market ⁷⁸. The democratization of participation approach encourages stakeholders to have «a seat at the table⁷⁹» to have symmetry of information and interpretations on the same issue, while the approach of « new public management » reduces participation in the possibility of expressing dissatisfaction with public services and thus putting aside values of general interest and equity⁸⁰. IWRM uses the approach of democratization of participation and is understood as a « Process promoting the development and coordinated management of water, territories and related resources in order to maximize economic and social well-being in an equitable manner and without compromising the sustainability of vital ecosystems ». IWRM is thus an approach to the management of national and international waters. This approach recognizes the need for a public-private partnership at all decision-making

⁷⁷ NATIONS UNIES, Action 21, New York, 1992, para. 18.9(c)

⁷⁸ MINTROM M., « Market Organizations and Deliberative Democracy: Choice and Voice in Public Service Delivery », *Administration & Society*, 35 (1), 2003, p. 52-81.

⁷⁹ DELEON L., « Public Management, Democracy and Politics », in Ferlie E., Lynn L.E., Pollitt C.(dir.), *The Oxford Handbook of Public Management*, Oxford, Oxford University Press, 2005, p. 103-130

⁸⁰ BHERER Laurence., Les relations ambiguës entre participation et politiques publiques P114, <https://www.cairn.info/revue-participations-2011-1-page-105.htm>

king levels as well as the need to decentralize water management. To do this, it recommends transversal coordination between sectors while considering the growing shortage and the various competing uses of water resources.⁸¹

IWRM only gains value when it is implemented in a participatory context where all stakeholders take part in the decision-making process. Participation is therefore an important step, because it facilitates cooperation between the different parties and facilitates the production of consensual management instruments. There are several levels which allow the degree of participation to be measured and consultation is only one level, so we have chosen to work on participation which is much more encompassing. Consultation is often highlighted, because countries hope to have feedback on analyses, alternatives and/or decisions. Several countries are also at this level which John Thompson differentiates from participation since it «consists only of asking people whether or not they approve of what has already been chosen ⁸²».

If it is therefore admitted beyond theoretical statements that the implementation of participation may be unrealizable in a socio-political context « if political systems are not inclined to integrate participatory decision-making mechanisms, or even if

⁸¹ L'élément le plus pertinent de la GIRE est la notion d'intégration en référence à des composantes environnementales, sociales, économiques et spatiales et notamment : l'intégration de toutes les ressources (l'eau sous toutes ses formes, les milieux aquatiques et les services écosystémiques rendus) ; l'intégration des savoirs et des expertises ; l'intégration sociale (intégration des besoins, des fonctions et l'harmonisation des usages ; l'intégration des acteurs (la participation, l'intégration des politiques) ; l'intégration économique ; l'intégration spatiale (le bassin versant).

⁸² THOMPSON John, « De l'expérimentation à une pratique renouvelée », Concertation citoyenne en urbanisme. La méthode du Community planning, Éditions adels, Paris, 2010 p. 16.

the political culture is not adapted to it⁸³ », its implementation in IWRM places the value of all stakeholders at the center of public action ⁸⁴. Furthermore, it demonstrates the confidence placed in actors in their ability to participate effectively in processes while highlighting the important role that the State or public agents have in the construction of a «participant community» inclusive and functional⁸⁵ and should help guide decisions. How do the Central African countries that shine through « spontaneity ⁸⁶ », since there is no participation strategy ⁸⁷, do

⁸³ AFFELTRANGER Bastien et LASSERRE Frédéric, « La gestion par bassin versant : du principe écologique à la contrainte politique- le cas du Mékong » *Vertigo*, vol. 4, n°3, 2003, p.5, [en ligne], [\[vertigo.revues.org/index3715.html\]](http://vertigo.revues.org/index3715.html) (March 26, 2020). P4

⁸⁴ « the value that results from the mixing of expert and societal values should normally be more realistic than the values of the society that are normatively scrutinized by experts » WAGLE U., « The Policy Science of Democracy: The Issues of Methodology and Citizen Participation », *Policy Sciences*, vol.33 n°2 2000, p. 209 consulted march,9, 2020

⁸⁵ FELDMAN M. S., KHADEMIAN A. M., « The Role of the Public Manager in Inclusion: Creating Communities of Participation », *Governance*, vol 20, issue2, 2007, p. 310.

⁸⁶ Dans son ouvrage, Gaudin explique les années 1960- 1970 ont d'abord été celles d'un certain « spontanéisme » de la participation. Il y explique que la science et le savoir expert gardaient toute leur légitimité et leur primauté. GAUDIN JP, La démocratie participative, Armand Colin, Paris, p. 15 ,2007

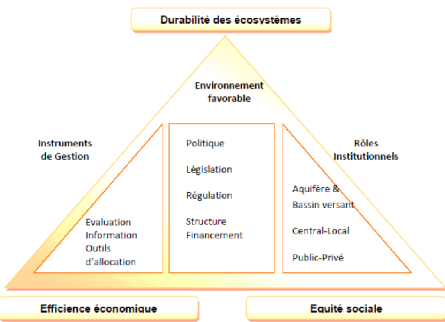
⁸⁷ Une stratégie de participation est souvent un outil utile pour assurer une représentation adéquate, en particulier des groupes défavorisés. Les pays d'Afrique centrale n'ont pas encore atteint le niveau de certains pays développés qui ont des politiques de participation. En Suisse, la loi fédérale l'aménagement du territoire de 1979 (LAT) en son article 4 et ses trois alinéas qui parle de l'obligation une participation minimum de de la population concernée, *ASSEMBLEE FEDERALE DE LA CONFEDERATION SUISSE*, 22 juillet 1979, *Loi fédérale sur l'aménagement du territoire (Loi sur l'aménagement du territoire, LAT) [en ligne]*. URL : <http://www.admin.ch/ch/fr/c700>. Html consulté 30 mars 2020

they manage to integrate public participation in water management? And how do disadvantaged groups in this region, which has not yet managed to emanate from strong social movements that can move the boundaries, contribute to the participatory management of water resources? In this article, it seems appropriate to present the political commitment of the government authorities (A); given that the implementation of IWRM should not be considered as the sole responsibility of the ministries responsible for water, despite the coordination role that the latter are called upon to play, we will also present the framework for participation of private companies and citizens (B).

A- The political commitment of government authorities: prerequisite for the organization of public participation

The implementation of IWRM requires political support and an approach based on the Dublin principles and relying on the 3 fundamental elements which are: economic efficiency, environmental sustainability, and social equity.

Diagram 1: IWRM implementation triangle



Source : Manuel de GIRE⁸⁸

The implementation of IWRM should not be considered as the sole responsibility of the ministries responsible for water, despite the coordination role that the latter are called upon to play. Political authorities set goals for access, use, protection, and conservation of water.

It is important at this level to consider the conditions put in place by the State to promote IWRM at the national level. Thus, we will return to the contribution of national governmental authorities⁸⁹ responsible for directing the implementation of IWRM (1) and we will show the coordination that is done on this subject (2) within a panel of countries⁹⁰ in central Africa.

1- The organization of participation in the water sector: The contribution of national governmental authorities

Participation plays a facilitating role in the adaptation of the entire work chain to IWRM: coordination and training, awareness, mobilization, awareness, accountability, and awareness. The importance of stakeholder participation is recognized⁹¹in

⁸⁸ 2IE, Manuel de GIRE, 2010, P46

⁸⁹ “Government authorities” means one or more ministries, or other organizations/institutions/agencies/bodies mandated or funded by public authorities.

⁹⁰ We were not able to obtain all the documentation on all the countries in the ECCAS area. We will therefore constantly return to the cases of Cameroon, Chad, Congo, CAR, Gabon and possibly Sao Tome.

⁹¹ 2ie, manuel technique de gestion intégrée des ressources en eau, 2010, P82 ; Cap-Net. Module de Formation, Plans GIRE (version traduite), mars 2005, P33

the process of adaptation to IWRM because it allows:

- **Identification of stakeholder interests:** it is necessary for the State or the cross-border organization to carry out an identification of the stakeholders because they are the ones who will each work at their level to make decisions oriented towards IWRM and to adapt it in practices.
- **Defining the importance of stakeholders:** depending on their importance in water management, a stakeholder will have the ability to easily adapt and create the support of others.
- **To define their influence on the management and use of water resources.**

In addition, the participation of stakeholders will facilitate the development of an IWRM adaptation strategy by involving them at the different stages of preparation and implementation. Finally, it helps to guarantee the success of water sector reforms since it intervenes both upstream in the decision-making process and downstream in implementation.

Thus, several countries have given their ministries the capacity to lead the implementation of national plans for IWRM. Thus, we can observe for example that in Congo, apart from the Ministry of Energy and Hydraulics, responsibilities are given to other Ministries which are effectively involved in IWRM. These are the Ministries responsible for agriculture, livestock, fishing, river transport, forestry, the environment, planning and finance. In the 2020-2023 outlook, the country wishes to be able to ensure technical, financial, and human capacity building.

In Cameroon, the decree organizing the Ministry of Water and Energy⁹² authorizes

⁹² Le décret n°2012/501 du 7 novembre 2012 portant organisation du ministère de l’Eau et de

the participation in IWRM of other organizations such as the Hydrological Research Center, the ministry in charge of Planning and Technical and Financial Partners including GWP, UNICEF and UNESCO. For adaptation to IWRM within the Directorate General for Water and the technical directorate for Hydraulic Resource Management in Gabon, an organic text sets out their missions, the implementation of which is closely related to the process of IWRM⁹³. Thus, capacity building and the creation of the National Water and Sanitation Commission (CNEA) are planned.

In CAR, there are texts that mandate government authorities to develop and implement IWRM⁹⁴.

Law No. 006.001 of April 12, 2006, on the water code does not include IWRM; however, it is currently under review. Its revision will make it possible to adopt a national IWRM plan (PANGIRE) and a national water policy. To further adapt to IWRM, the country wishes to improve knowledge of water resources and develop the capacities of management stakeholders. The 2030 horizon was retained as a perspective for improving sustainable water resources management, with the design and operationalization of water resources management structures at the basin scale as recommended by IWRM.

In Chad, although government authorities have received clear mandates to lead IWRM planning effectively, the need for capacity building for the implementation, monitoring-evaluation, and periodic review of the IWRM plan is required.

l’Energie
⁹³ Ministère de l’eau et de l’Energie, Rapport sur l’atelier de validation du questionnaire d’évaluation du degré de mise en œuvre de l’indicateur de Développement 6.5.
⁹⁴ Le décret n° 18.087 du 10 avril 2018 portant organisation et fonctionnement du Ministère du développement de l’Energie et des Ressources Hydrauliques et fixant les attributions du Ministre.

Finally, in São Tomé and Príncipe, the Ministry of Public Works, Infrastructure, Natural Resources and Environment is the structure designated to implement IWRM. It was expressed⁹⁵ the need to institutionalize an entity that will oversee managing the national water policy and strengthen the capacities of institutions and non-governmental organizations (NGOs). As in other countries in the region, government actors recognize that the revision of existing laws in the field of water resources will allow better adaptation to IWRM since it will make it possible to define specific management instruments.

Overall, we can see that specific government actors have been designated to adapt the national water resources management framework to IWRM. Efforts are being made to move forward. However, certain elements slow down projects, including budgetary restrictions and in certain cases, internal crises (RCA).

Beyond the simple designation of government actors, the need to strengthen the skills of other actors, whether public or private, is felt. This will enable them to contribute to standardizing the implementation of IWRM, each in their area of expertise. Another element that seems important to mention here concerns the laws on the water code. Indeed, many countries adopted water codes (mostly from the 2000s) which were not really oriented towards IWRM even though it was already adopted even at the African level. To date, all government actors agree that these laws must be revised so that they reflect the principles promoted by IWRM. This situation reveals the level of perception to which the

⁹⁵ Ministère des travaux publics, de l'infrastructure, des ressources naturelles et de l'environnement, Rapport sur l'atelier de validation du questionnaire d'évaluation du degré de mise en œuvre de l'indicateur de Développement 6.5.1 "Groupe de mise en œuvre de la gestion intégrée des ressources en eau", juillet 2020

actors have reached when speaking about understanding the usefulness of IWRM. We then remember that regardless of external winds and global dynamics, the internalization of a problem of this nature requires the perception that national actors have of it and the degree of understanding to which they have reached to trigger the process of change. As the process of change has begun to adapt the national framework to IWRM, it seems appropriate to observe how coordination between national government authorities representing the different sectors is operationalized on the ground.

2- Coordination between national government authorities: towards the effectiveness of public participation in the water sector at the national level

Coordination between national government authorities representing different sectors ⁹⁶ concerns water resources as well as policy, planning and management.

In Gabon, the Ministry of Energy and Hydraulic Resources defines the water management policy and coordinates activities with different administrative entities in the water sector (Environment, Aquatic Ecosystems, Agriculture, Health, Mines, Development of Territories, Finance etc.). Among the activities to improve intersectoral coordination, there are: strengthening and facilitating the work of the national water policy development committee (multisectoral involvement); the involvement of different ministries linked to the water sector, local authorities, Civil Society Organi-

⁹⁶ Concerns coordination between government authorities responsible for water management and those responsible for other policy areas (such as agriculture, energy, climate, environment, etc.) dependent on water or affecting it.

zations, and the private sector. This support is also planned for the formalization and capacity building of the National Water and Sanitation Commission (CNEA) with a view to its operationalization. Finally, the country also plans to put in place a strategy for mobilizing funds and developing a PANGIRE for Gabon by 2025. Chad has certain specificities such as the presence of the permanent unit in charge of rural development housed within of the Ministry of Planning, the existence of a national WASH cluster, a pastoral platform at the Ministry of Livestock and the coordination of donors of funds in the water sector at the national level. In Chad, coordination between government authorities is done through interministerial workshops to validate texts and laws regulating the management of water resources as well as policy and planning.

Congo is an illustrative example of adaptation to IWRM which is at the origin of the creation of several structures and platforms which facilitate the adaptation of the country to IWRM as well as its effective implementation. Thus, there is, among other things, an Advisory Council for Water⁹⁷, operational IWRM thematic platforms, the National Water Partnership (PNE), the international hydrological program (PHI-Congo), the WASH technical committee, the national focal structure (PACOB), the national consultation platform (PCN-CICOS) and Consultations between sector ministries. The country expresses the need to strengthen the operational capacities of consultation and coordination frameworks.

In Cameroon, a decree made it possible to create and set the powers, organization and functioning of the National Water

⁹⁷ Established by decree no. 2008-67 of April 3, 2008. During the recent stakeholder consultation workshop, it was decided to add all the key players in the sector. This council will henceforth be called the Water and Sanitation Consultative Council (CCEA).

Committee. It is an interministerial institution within which all ministerial stakeholders in the water sector can consult, plan and decide. However, its functioning must be improved since it is not very active. There are also other sectoral consultation frameworks whose operation does not have the merit of being clear. These are promising and conducive frameworks for better adaptation to IWRM, however, we still need to work to improve them for better impact.

In CAR, the appeasement of the political climate has enabled the relaunch of activities with a view to adapting IWRM at the national level. Thus, between 2017 and 2019, we are witnessing the promulgation of two ministerial decrees creating consultation frameworks for IWRM. So it was created in 2017⁹⁸ a consultation and coordination platform for stakeholders in the water sector and in 2019⁹⁹, a technical committee to steer the process of developing the new policy document. There is also a national water partnership (PNE) which signed in 2020 for a period of three years¹⁰⁰, a memorandum of understanding with the ministry responsible for water to facilitate collaboration between the two parties to jointly promote the development and management of water resources through the planning and implementation of IWRM in the country. As part of this agreement, the General Directorate of Hydraulics will be the focal point for the PNE-RCA on all technical aspects. The ministry in charge of water is committed to involving the PNE-RCA in the planning, design, implementation and monitoring-evaluation program of the national water policy and strategies; support the PNE-RCA by advocating for the mobilization of the resources necessary to achieve the objectives

⁹⁸ Arrêté n° 003 du 27 janvier 2017 signé par le premier ministre portant création de la plateforme de concertation et de coordination des acteurs du secteur de l'eau

⁹⁹ Arrêté n° 009/19.MDERH.DIRCAB.DGRH du 11 février 2019 portant création

¹⁰⁰ GWP CAF, annual report, 2020

set; entrust the PNE-RCA with the implementation of certain capacity building activities for stakeholders in the water sector. For its part, the PNE-RCA is committed to: Supporting the planning, design, implementation and monitoring-evaluation program of national water policy and strategies; provide expertise for capacity building of stakeholders in the water sector, contribute to the implementation of management tools and decision support instruments, create and strengthen mechanisms for exchanging information and sharing of experiences on water, Facilitate the mobilization of funds for the water sector through the establishment of development projects and programs, and support the development of the water sector and the capacity to manage water resources and the development of water resources management. The challenges encountered in the CAR at this level concern the mobilization of funds, coordination between the institutions responsible for the implementation of an operational national water information system, the operationalization of basin/aquifer agencies created by the water code and the clarification of the institutional landscape. Note that there is a point of disagreement between two major actors: the Ministry in charge of Hydraulics and the Ministry of Transport; it concerns the distribution of attributions relating to surface water.

In summary, countries have understood the importance of opening water management to other public or private actors. The participatory principle of IWRM is considered in practice. The process of understanding must have taken a long time if we refer to the dates of creation of the various coordination committees and their still embryonic state of operation. The fact remains that countries have understood the importance of creating a favorable environment in which IWRM can be deployed.

According to country information, it appears that the system still requires improve-

ment. Thus, it seems logical to us to be interested in citizen and private sector participation given their role in the management and use of water and the impact of water-related crises daily.

B- Participation of private companies, citizens, and disadvantaged populations in water management in Central Africa: between hesitation and imperative...

The participatory approach is because people and groups have the capacity to ensure their access to resources and aims to give communities back the power to act on their destiny. By subscribing to this principle, the State, in concert with other stakeholders, takes guidelines to ensure equity. Today, the State no longer acts alone, decision-making processes are open, and in the field of water their openness is imperative for achieving results; there is a great need to work with all the actors who co-produce public action¹⁰¹.

The involvement of stakeholders also has a role of regulating trust between the government and other actors, it helps to reduce the probability of conflicts which could prevent the implementation of projects by making actions transparent and establishing a relationship long-term collaboration. Indeed, participation in the water sector places stakeholders at the heart of the decision-making process and in fact creates a space for discussion which leads the State to develop new mechanisms for adjusting

¹⁰¹ Pierre J., « Reinventing governance, reinventing democracy? », *Policy & Politics*, 37 (4), 2009, p. 599

to common standards with the idea that the state must coordinate, but not execute¹⁰².

Furthermore, stakeholders very often have a lot of field information that governments need; their involvement in the entire decision-making process allows the State to guide its decisions by considering these bases and lead to informed and realistic decision-making.

IWRM is based on a participatory approach that includes the participation of users, planners, and policy makers at all levels. However, their participation rates remain low in Central Africa. It then seems appropriate to present, based on country information, the framework for participation of businesses and citizens (1) and the participation of so-called vulnerable groups (2).

1 - Participation of private companies and citizens: developing a framework

In Central Africa, local actors have been accustomed to political exclusion due to their socialization. Today, due to international movements which are gradually leading to the participation of civil society, their inclusion is increasingly widespread, but not systematized. It is therefore neces-

¹⁰² Le fameux « *steering, rather than rowing* » d'Osborne et Gaebler « *la prestation des services a été décentralisée vers des agences publiques autonomes et spécialisées, des entreprises privées ou des organismes sans but lucratif. Cela permet d'intégrer des mécanismes de marché qui mettent en concurrence des prestataires publics et privés. Ces réformes appliquées à des degrés divers selon les pays ont donc donné un rôle, plus important à des acteurs, qui n'étaient pas centraux dans la mise en œuvre des politiques publiques. Ce mouvement est aussi à l'origine de plusieurs dispositifs participatifs, notamment en Angleterre où le New Policy Management a été fortement appliqué* » Laurence Bherer, « Les relations ambiguës entre participation et politiques publiques », in <https://www.cairn.info/revue-participations-2011-1-page-105.htm> P113

sary to examine theoretically and practically the participation of private companies and citizens because they are actors in the sector and, as such, they have the right to take part in the management processes of the water resource.

a-The participation framework for private companies

Business participation should be supervised by government institutions; however, not only is their participation not sufficiently institutionalized, but even in practice, their participation is not very visible yet paradoxically, they are large users of water.

The analysis of private sector participation generally reveals low participation and non-institutionalization of the related processes. The National Water Partnerships (NWP), institutions coordinated by the GWP Central Africa, remain mainly the only framework which allows and facilitates the participation of private actors even if here too efforts remain to be made to guarantee their effectiveness. PNEs are not yet present in all countries, but in those where they exist, they bring together all public and private actors, NGOs, associations, etc. From national perspectives, there is reason to consider strengthening communication with the private sector for better involvement in IWRM and establishing a public-private partnership.

The institutionalization of private sector participation in water resources management makes Chad an example to follow. In fact, participation is governed by several texts¹⁰³ and Vision 2030 «the Chad we want

¹⁰³ Loi n°006/PR/2008 instituant la Charte des investissements de la République du Tchad (CI), et la Loi n°08/PR/2016 portant Code de transparence et de bonne gouvernance dans la gestion des finances publiques. Ces lois sont complétées l'ordonnance N°06/PR/2017 qui constitue le dispositif juridique du partenariat

» considers the contribution of the private sector as does the 2017-2021 national development plan (PND). There is still room to strengthen the mechanism for coordinating and monitoring the activities of all partners who support the government of Chad as well as the mechanism for centralizing data resulting from the implementation of activities by partners.

The big problem overall is the fact that there are consultation frameworks between public authorities and private companies, but that there is not yet an agreement between private companies, financial and technical partners, and the government. Countries must therefore recognize the importance of promoting actions aimed at greater involvement of the private sector so that its impact is significant. There is a real need to move away from simple consultation of government authorities and private companies towards real institutionalization as in the CAR where a law establishing the legal framework for Public Private Partnership in the Central African Republic was promulgated.¹⁰⁴

We note that private brewing, agricultural and aluminum production, and processing structures are at the forefront of water-consuming businesses with the possibility of waste dumping. Associating them with IWRM is imperative for raising awareness of the issues related to sustainable water consumption. It is no longer just a question of being able to pay water bills but of understanding the ecological footprint of irrational and uncontrolled use. Their full participation in the process will help to raise awareness of the need to apply IWRM and bring them into line with the government actions initiated.

public-privé en République du Tchad, et par le Décret N° 212/2019 portant création d'un cadre institutionnel d'un partenariat public-privé donc implication du secteur privé dans la mise en œuvre et gestion des projets.

¹⁰⁴ La loi n°19.007 du 24 juin 2019

Furthermore, private companies can be real patrons who financially support the mobilization of funds in the water sector both at the national and international level. It should be mentioned that many private companies established in Central Africa are of foreign origin or their capital is mainly foreign recruiting hundreds of people, they are also an interesting relay for training and informing citizens on the question.

b-The citizen participation framework

In the national survey questionnaire relating to SDG indicator 6.5.1, the citizen is defined as being « all interested parties likely to be affected by an issue or intervention relating to water resources. These include organizations, institutions, academia, civil society, and individuals, excluding government organizations ». It is a question of seeing how they participate in national and local processes¹⁰⁵ policy development, planning and management relating to water resources.

In the countries of the sub-region, citizen participation is not effective at the institutional level. However, some countries have put in place provisions that should facilitate this participation. In Chad, among the founding principles of the country's water policy, the need to define a clear legislative and regulatory framework for all water operators, including associations, is mentioned in the context of institutional strengthening. At the local level, the Water and Sanitation Master Plan ruled on the need for the existence of a consultation framework at all levels, including the local level.

Some texts in Cameroon promote citizen participation in national policy devel-

¹⁰⁵ Les exemples de « niveau local » comprennent notamment les municipalités (villes, villages, etc.), les communautés, les bassins/affluents/aquifères/deltas et les associations d'usagers de l'eau.

opment, planning and management processes relating to water resources. These are: the Law establishing the general code of decentralized local authorities¹⁰⁶; it provides in paragraph (1) of its article 40 that any resident or community can, at its own expense, request communication or take a total or partial copy of the minutes of the deliberative bodies, budgets, projects and annual performance reports, plans development, accounts or orders, following the terms and conditions set by regulation. In the Decree¹⁰⁷ which sets out the methods for carrying out environmental and social impact studies, it describes the general conditions for carrying out environmental impact notices, environmental and social impact studies, and strategic environmental assessments. In view of the multiplicity of private companies extracting water for commercial purposes, there was the promulgation of a decree¹⁰⁸ which specifies the terms and conditions for withdrawing surface water or groundwater for industrial or commercial purposes.

For the moment, there are no local policies, planning and management of water resources in the countries of the Central Africa sub-region. Countries are considering establishing local WASH activity monitoring committees, community management frameworks and local water partnerships at the national level. This requires capacity building to improve their knowledge and advocacy with decentralized territorial communities for the development and implementation of local policies, planning and management of water resources.

Note that even if the institutionalization of participation is still in progress, in practice there is an effort at inclusion in the processes. In Congo, this was the case during the stakeholder consultation work-

shop¹⁰⁹ which aimed to present, exchange, and approve the draft National Water and Sanitation Policy (PNEA) document by the main stakeholders in the water sector in the country. This workshop brought together thirty participants¹¹⁰ from ministries, parastatal organizations, NGOs, civil society organizations, research and education stakeholders, the private sector as well as technical and financial partners such as UNICEF and UNESCO¹¹¹.

In Chad, during the stakeholder consultation, organized by the Ministry of Urban and Rural Water in collaboration with the National Partnership for Water of Chad (PNE Chad), more than 15 stakeholders from ministries were brought together., the private sector, civil society, research institutions and focal points of transboundary basin organizations (LCBC, ABN) to assess the degree of implementation of IWRM in the country.

Cameroon organized stakeholder workshops for the validation of indicators 6.5.1 and 6.5.2. These workshops each brought together around twenty participants from ministries (water and energy, transport, agriculture, economy and planning, housing and urban development), representatives of United Nations agencies (UNESCO), civil society organizations (SAILID, Water for Life, Young Volunteers for the Environment) and networks of youth organizations (RECOJAC).

In Gabon, there is a multi-sectoral involvement committee for the development of national policy which involves the different ministries linked to the water sector, communities, NGOs, etc. For the installa-

¹⁰⁹ L'atelier a été organisé avec l'appui du GWP-Caf et de l'UNICEF du 25 au 26 Novembre 2020 à Brazzaville.

¹¹⁰ Rapport de l'atelier de consultation des parties prenante

¹¹¹ L'atelier, financé par le Partenariat National de l'Eau du Congo (PNE-Congo), UNICEF Congo et le ministère de l'Energie et de l'Hydraulique

¹⁰⁶ La Loi N° 2019/024 DU 24 Décembre 2019

¹⁰⁷ Le Décret n° 2013/0171/PM du 14 février 2013

¹⁰⁸ Le Décret n° 2001/164/PM du 08 mai 2001

tion of village waterworks, public consultations are carried out during the implementation of the project. Public consultation processes for citizens are organized when environmental impact studies are carried out. Government authorities sometimes ask stakeholders for local information, feedback, and opinions. Representatives of the populations at the decentralized level are considered within the National Water and Sanitation Commission (CNEA) which is not yet operational. It is envisaged to raise the level of stakeholder participation as part of the implementation of decentralization in the water sector.

In practice, there is a need to consider strengthening citizen participation by organizing them into associations or dynamic groups that can contribute to making decisions that concern them on national processes. Thus, Water User associations, water point management committees, lake management organizations, action committees in the provinces, departments and cantons must be set up and above all operationalized to increase participation which is still considered low¹¹².

From the above, it appears that in Central African countries inclusive participation mechanisms are not effective and the region is ranked last in Africa in this aspect.¹¹³ Even the perspectives envisaged will not allow full participation since it is more of a consultative participation either for the validation of documents or for implementation, but not yet at the design level. It is then important for us to review the levels of participation which tend to increase the complexity of management ¹¹⁴. We will

¹¹² Ministère de l'hydraulique Urbaine et Rurale, Questionnaire d'enquête national relatif à l'indicateur 6.5.1 des ODD, Degré de mise en œuvre de la gestion intégrée des ressources en eau (0 - 100), Aout 2020

¹¹³ AMCOW, 2018, Op Cit. P26

¹¹⁴ WESTER P. et WARNERJ., « River basin

therefore focus on the participation of vulnerable populations.

2- Participation of vulnerable populations: concern for representativeness

The analysis of stakeholders, including vulnerable populations who intervene in water management, is important to understand their degree of participation as well as their level of influence.

In the context of participation, principle No. 3 of IWRM focuses on equity, particularly the participation of women, young people, and vulnerable groups including indigenous groups, ethnic minorities, migrants¹¹⁵, isolated communities, subsistence farmers, people living in poverty, populations in slums and informal settlements. Their participation is also an important element in the context which wants no one to be left behind¹¹⁶.

Regarding the participation of vulnerable populations, there is still room to promote actions to reduce inequalities in the development of IWRM strategic documents at the national level, because this participation still seems poorly understood and is not yet integrated neither in practice nor in texts and even less at the institutional level. If this aspect is sometimes recommended, most countries in their perspectives wish to integrate this dimension into the documents being validated (national water policy, revised water code).

management reconsidered », in Anthony TURTON et Roland HENWOOD (dir.), *Hydropolitics in the Developing World. A Southern African Perspective*, Pretoria, African Water Issues Research Unit (AWIRU), 2002, p 69

¹¹⁵ Réfugiés, personnes déplacées dans leur propre pays, demandeurs d'asile

¹¹⁶ Il s'agit d'un programme dont l'un des principes clés du Programme 2030 est « ne laisser personne de côté »

Regarding sex equality in particular, the gender dimension, it must be understood that this is a description of socially constructed relationships¹¹⁷ between women and men. This is a reference to the differences and/or inequalities that characterize and influence the lives of women and men. Gender relations are therefore dynamic and not fixed, they are variable and can be transformed, evolve, be part of social change.¹¹⁸ The Gender Principle assumes that the interest and contributions of women in society are considered in the formulation and implementation of policies and programs, capacity development, planning and investment operations in the sector. some water.

In fact, women ¹¹⁹, play a large role in the supply, management, and preservation of water as well as in the water-related load; However, they are very little involved in decision-making processes and their role is still in the domestic sphere.¹²⁰. This is be-

¹¹⁷ Le genre renvoie donc aux catégories sociales (féminin et masculin) et non aux catégories sexuelles (hommes et femmes). En d'autres termes, c'est la société qui définit les rôles et les responsabilités des deux sexes.

¹¹⁸ On acquiert le sexe à la naissance. Tous les Hommes naissent soit comme une femme ou comme un homme. Le terme "sexe" fait référence à l'état biologique, le sexe ne change pas avec le temps, ce qui est le contraire pour le genre.

¹¹⁹ Voir, par exemple, le troisième principe de Dublin (1992) : « Les femmes jouent un rôle essentiel dans l'approvisionnement, la gestion et la préservation de l'eau. Les arrangements institutionnels relatifs à la [...] gestion des ressources en eau tiennent rarement compte du rôle primordial des femmes [...]. L'adoption et l'application de ce principe exigent que l'on s'intéresse aux besoins particuliers des femmes et qu'on leur donne les moyens et le pouvoir de participer, à tous les niveaux, aux programmes conduits dans le domaine de l'eau, y compris la prise de décisions et la mise en œuvre, selon les modalités qu'elles définiront elles-mêmes. »

¹²⁰ DOS SANTOS Stéphanie, « le rôle des femmes selon la GIRE : regard sur le troisième principe de Dublin en Afrique au sud du Sahara », Ss la dir de Frédéric Julien, dans *La gestion intégrée des ressources en eau en Afrique subsaharienne Paradigme occidental*, pratiques

cause there are implicit and explicit rules governing women/men relationships and assigning them distinct work, values, responsibilities, and obligations. These rules are applied at three levels: the cultural substrate (norms and values of society), institutions (family, education, and employment system, etc.) and socialization processes, particularly within the family. This allocation of roles and relationships differ from one country to another, from one continent to another, from one culture to another.

To assess women's participation, we refer to laws, plans, strategies and other frameworks or procedures that aim to achieve gender equality objectives and support women's participation and their ability to be heard and to exert influence. However, in the water sector, there is still no concrete mechanism provided for this purpose even if in practice there are more and more women. There is an increasing involvement of women in the water sector, but there is no formal framework for their integration into decision-making spheres.

While countries intend to take advantage of the validation of the National Water Policy to ensure that gender issues are considered, the vast majority do not approach this issue in the sense of carrying out an analysis gender. This gender analysis is an analytical tool that can help discover how gender relations affect a development problem in the field of water. The aim is simply to show that gender relations will likely affect the gender solution. Furthermore, on the eve of the validation of these country strategic documents, a gender profile has not really been established within each country. This is the result of a detailed gender analysis of the situation of women and men in the country and in the water sector. These gender profile results would have

africaines, , 2012, Presses de l'Université du Québec, p136

been useful to guide sector policies and co-operation programming frameworks. Until countries implement a Gender Transformative Approach¹²¹(GTA), they will have difficulty ensuring good participation and representation of women in the sector. This approach is currently promoted by the GWP in its Water Climate Development and Gender program, better known in English as « Water Climate development and Gender (WACDEP-G) ».

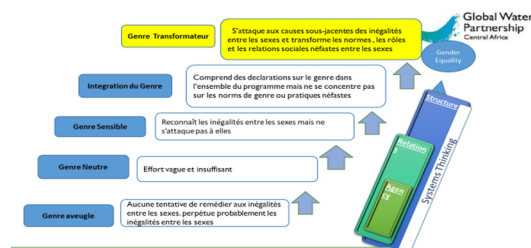
To better understand the process for achieving ATG, the GWP offers the gender equality continuum tool. This tool allows you to understand at what level a country is in its different development policies. There are 5 levels in this scale:

- **Gender blind:** here we ignore: the roles; the rights, responsibilities and obligations associated with being female or male; power dynamics between and among men and women, boys, and girls.
- **Gender Neutral:** Makes no mention of the specifics of men and women.
- **Gender sensitive:** here the system can recognize that inequalities exist without addressing them.
- **Gender mainstreaming:** it is identified as an accommodating approach because it involves working around gender differences and inequalities, without addressing the underlying causes.
- **Transformative Gender:** This approach has the particularity of examining Gender norms and dynamics; to strengthen or create systems that support gender equality (for example, development of policies that take into account the needs and strategic interests of men and women); to strengthen or

¹²¹ -It is a strategy/method that aims to end gender inequality, which is rooted in norms and values present among all people. It is based on human rights. Its key elements are accountability, participation, non-discrimination, equality, and transparency.

create gender dynamics (for example the development of policies which grant the same primacy to men and women in all positions); and change inequitable gender norms and dynamics.

Figure 2: gender scale



Source : GWP-CAF¹²²

In all the countries of the region, there is a lot of communication, awareness-raising and appropriation work to be done to break down socio-cultural barriers and to achieve a transformative approach to gender that will facilitate participation. women in the water sector.

Refer to table 1.

This table highlights the low participation of all water stakeholders and the need to establish systematic participation through institutionalization. On analysis, participation in IWRM at the country level is not effective if we stick to the limits observed and the government must still make efforts to systematically integrate all stakeholders.

Conclusion

It appears from the above that public participation in participatory water management is not easy, because of the multitude of stakeholders that must be involved and its cost. In addition, the country context, political crises, and socio-cultural obstacles significantly slow down the process that has

¹²² Henriette Elise BIKIE, 14e comité de pilotage du GWP-CAF, novembre 2020

Table 1 : Analysis of stakeholder participation in Central Africa

Stakeholder groups	Level of commitment		
	Low (had opportunity to contribute)	Medium (some contributions)	High (discussion/ negotiation)
National water agencies			
Other public sector agencies			X
Subnational water agencies			
Basin/ Aquifer Management Agencies			X
Water user associations	X		
Civil society		X	
Private sector		X	
Vulnerable groups	X		
Gender specialists	X		
Researchers/academia			X
Specialists in issues related to cross-border collaboration			X
Focal points for other SDGs			X
Young people	X		

Source : Author

already begun. Water management with all stakeholders at the national level does not pose the same challenges as management across borders. Since participation is not regulated, it is not anchored in an established operating system, hence its unstable nature in Central Africa despite the great efforts made by States. If at the national level, we must deal with actors from the same era having more or less the same orientation, at the cross-border level this is not always the case, hence the potential conflicts linked to national interests on shared waters.

Bibliography

National texts

- 1. La loi n° 06.001 du 12 avril 2006 portant code de l'eau de la République centrafricaine
- 2. Loi n° 15/026 du 31 décembre 2015 relative à l'eau en République Démocratique du Congo
- 3. Loi 98/005 du 14 avril 1998 portant régime de l'eau de la République du Cameroun
- 4. Loi n° 24/2016 du 29 décembre 2016 fixant le régime juridique de la production du transport et de la distribution électrique et de l'eau potable en République Gabonaise
- 5. Loi n° 13-2003 du 10 avril 2003 portant code de l'eau de la République du Congo Brazzaville
- 6. Loi n° 16/PR/99 du 18 Août 1999 portant code de l'eau de la République Tchadienne

Works/books

- 7. 2IE, Manuel de GIRE, 2010 ; 141 pages.
- 8. DELEON L., « Public Management, Democracy and Politics », in Ferlie E., Lynn L.E., Pollitt C. (dir.), The Oxford Handbook of Public Management, Oxford, Oxford University Press, 2005
- 9. DOS SANTOS Stéphanie, « le rôle des femmes selon la GIRE : regard sur le troisième principe de Dublin en Afrique au sud du Sahara », Ss la dir de Frédéric Julien,

dans La gestion intégrée des ressources en eau en Afrique subsaharienne Paradigme occidental, pratiques africaines, Presses de l'Université du Québec, 2012

- 10. GAUDIN JP, La démocratie participative, Armand Colin, Paris, 2007
- 11. MICHELOT Agnès., « La construction du principe de participation : réflexions autour de la convention d'Aarhus sur l'accès à l'information, la participation du public au processus décisionnel et l'accès à la justice en matière d'environnement », La démocratie environnementale. Participation du public aux décisions et politiques environnementales, Éditions universitaires de Dijon, collection Sociétés, Dijon, 2009
- 12. MINTROM M., « Market Organizations and Deliberative Democracy: Choice and Voice in Public Service Delivery », Administration & Society, 35 (1), 2003
- 13. THOMPSON John, « De l'expérimentation à une pratique renouvelée », Concertation citoyenne en urbanisme. La méthode du Community planning, Éditions adels, Paris, 2010
- 14. WESTER P. et WARNERJ., « River basin management reconsidered », in Anthony TURTON et Roland HENWOOD (dir.), Hydropolitics in the Developing World. A Southern African Perspective, Pretoria, African Water Issues Research Unit (AWIRU), 2002
- 15. WESTER Philippus. et WARNER Jeroen, « River basin management reconsidered », in TURTON Anthony et HENWOOD Roland (dir.), Hydropolitics in the

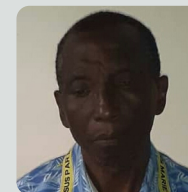
Developing World. A Southern African Perspective, Pretoria, African Water Issues Research Unit (AWIRU), 2002

Articles

- AFFELTRANGER Bastien et LAS-SERRE Frédéric, « La gestion par bassin versant : du principe écologique à la contrainte politique- le cas du Mékong » Vertigo, vol. 4, n°3, 2003, p.5, [en ligne], [vertigo.revues.org/index3715.html] (26 mars 2020). P4
 - BHERER Laurence., Les relations ambiguës entre participation et politiques publiques P114, <https://www.cairn.info/revue-participations-2011-1-page-105.htm>
 - FELDMAN M. S., KHADEMIAN A. M., « The Role of the Public Manager in Inclusion: Creating Communities of Participation », Governance, vol 20, issue2, 2007,
 - WAGLE U., « The Policy Science of Democracy: The Issues of Methodology and Citizen Participation », Policy Sciences, vol.33 n°2 2000, p. 209, consulté le 9 Août 2023
- ### Reports
- GWP CAF, rapport annuel 2020
 - NATIONS UNIES, Action 21, New York, 1992

Cameroon: The need for access to running drinking water for all

CAMEROON



By Jean Marie AMOA

Former certified PE teacher, Vice-president of the ASPROBIO AGM association

Introduction	77
A-Resource scarcity: a situation with distant origins	77
B-Actions needed for a normal situation	78
Conclusion	79

Introduction

« The water has returned »; « there is water » ; such are the cries of joy that have accompanied the return of running water for several decades in Cameroon.

Dry taps, water that struggles to come out of the taps when it is present, a situation that has become normal in Cameroon for decades.

Africa in miniature, Cameroon is nevertheless a rich country with among others:

- The Ekom Kam waterfalls in the west of the country, between the towns of Nkongsamba and Melon
- Nachtigal Falls; northeast of the capital Yaoundé; in the heart of the Sanaga River
- The Lobé waterfalls in the south of the country, near the town of Kribi

It is important to examine the causes of this inventory, the lack of running drinking water (A) and make some suggestions (B).

A-Resource scarcity: a situation with distant origins

Lack of competition: A single water management operator with an atypical policy

The Cameroon Water Utilities Corporation (CAMWATER) is today the only operator involved in the supply of water to the populations since December 2005

Before 2005

The National Water Company of Cameroon (SNEC) held the monopoly of

water distribution and network extension. It is indeed this company which was the main concessionaire of this service in most cities with a network.

SNEC policy:

– Connections in poor neighborhoods are generally made without considering the rules of the art. Steep slopes and heavy rainfall contribute to the erosion of land that exposes the pipes. The slightest shock can cause ruptures and water leaks. The water can thus flow for days or even weeks even when the SNEC agents have been informed. The amount of water lost is such that the rightful owner cannot pay. So, his meter is removed and the water supply suspended. Indeed, the SNEC agents are waiting for the owner to bear the travel costs to repair the leak.

– Inadequate SNEC pipes in informal settlements. Indeed, poor households generally located on steep slopes and in valleys are generally very far from main roads and therefore very far from the network. The longer the distance, the higher the cost¹²³

From 2005,

The Cameroon Water Utilities Corporation (CAMWATER) is a Cameroonian public capital company, endowed with legal personality and financial autonomy, created in 2005 by Decree N° 2005/494 of December 31, 2005, and reorganized in 2018 by Decree N° 2018/144 of February 20, 2018, following the end of the lease.

With the resumption of the activities formerly devolved to the farmer, the State assigned him two main missions: the man-

¹²³ - Mpakam Hernanie Grelle, Kamgang Kabeyne, B.V., Kouam Kenmogne, G.-R., Tamo Tatietse et Georges E. Ekodeck, L'accès à l'eau potable et à l'assainissement dans les villes des pays en développement : cas de Basoussam (Cameroun), dans VertigO - la revue électronique en sciences de l'environnement, Volume 7 Numéro 2 | septembre 2006.

agement of the assets and rights allocated to the public service of drinking water in urban and peri-urban areas; and the operation of the public service for the production, transport, and distribution of drinking water in urban and peri-urban areas.

According to the decree, CAMWATER can also ensure the construction and management of infrastructure related to the public sanitation service, in particular the collection, transport, and treatment of wastewater.

To do this, the scope of intervention of CAMWATER as defined in the concession contract, includes the urban and peri-urban area estimated at least to date at 360 localities in Cameroon if we only consider the chief towns of 'Borough. At the institutional level, the Company is placed under the technical supervision of the Ministry of Water and Energy (MINEE) and financial, of the Ministry of Finance (MINFI)¹²⁴.

Despite the change in the operating company for the public drinking water service in 2005, the situation is far from normal regarding the distribution of running drinking water. Load shedding and water cuts are the daily life of the populations

B-Actions needed for a normal situation

The opening to competition-exit the monopoly

Monopoly quite regularly leads to situations of omnipotence. The absence of competition does not motivate to surpass oneself, to offer a better service to the populations.

Not all neighborhoods and villages in Cameroon have a water network: Lack of budget?

¹²⁴ https://fr.wikipedia.org/wiki/Cameroon_Water_Uilities_Corporation

Why is competition policy important for consumers?

Competition policy aims to enforce rules to ensure that companies compete fairly. Competition policy helps to stimulate entrepreneurship and productivity, broaden the offer for consumers, lower prices and improve the quality of goods and services.

Low prices for everyone: The easiest way to gain market share is to offer a better price. In a competitive market, prices are driven down. This is a benefit for consumers, but not only: companies are encouraged to produce if more people can afford to buy their products, which stimulates the whole economy.

Better quality: Competition also encourages companies to improve the quality of the products and services they sell, to attract more customers and increase their market share. Quality can mean: products that last longer and work better; more efficient after-sales or repair services; better customer service.

More choice: In a competitive market, companies seek to distinguish their products from others. For the consumer, this means more choice, and the possibility of opting for the quality-price ratio which suits him best.

Innovation: To offer this choice to consumers, and to produce better, companies must be innovative – from product design to the services offered, including production techniques.¹²⁵

Conclusion

The absence of running drinking water

¹²⁵ -https://competition-policy.ec.europa.eu/about/why-competition-policy-important-consumers_fr

is an abnormal and alarming situation. A situation which it is essential to remedy to allow access to running drinking water for all in Cameroon.

Bibliography

Article

📖 Mpakam Hernanie Grelle, Kamgang Kabeyne, B.V., Kouam Kenmogne, G.-R., Tamo Tatietse et Georges E. Ekodeck, L'accès à l'eau potable et à l'assainissement dans les villes des pays en développement : cas de Basoussam (Cameroun), dans VertigO - la revue électronique en sciences de l'environnement, Volume 7 Numéro 2 | septembre 2006.

Web Sites

🔗 https://competition-policy.ec.europa.eu/about/why-competition-policy-important-consumers_fr

🔗 https://fr.wikipedia.org/wiki/Cameroon_Water_Uilities_Corporation



ASsociation pour la **PRO**tection de la
BIOdiversité et **A**doption de **G**estes
Marqueurs

RIEDD number 1 - September 2023